Kinoton GMBH

Operating Manual

FP 50 E PREMIERE Console Projector

DIGITAL CINEMA
FILM TECHNOLOGY
STUDIO TECHNOLOGY
CUSTOMIZED SOLUTIONS
360° DISPLAY SYSTEMS

Preface

Dear customer,

this operating manual will help you get acquainted with the projector and to make use of its possible applications in accordance with the requirements.

This operating manual includes important hints for a safe, proper, correct and economic operation.

It will also help you to avoid danger, to reduce failures and to increase life and reliability of the projector.

This operating manual includes useful hints for proprietor and personnel obligations.
It does not substitute, but supports, a thorough training period.

We confirm that the information given in this manual is true and correct to the best of our knowledge and belief. However, notwithstanding all best care and attention, technical inaccuracies and typographical errors cannot be fully excluded.
As far as we did not assure explicitly and written form any special characteristics and suitability of a product for a certain intended purpose, the statement in this manual are generally without obligation.
All descriptions, illustrations and technical data comply with the technical status of the product at the date of printing of this manual. Any modifications are subject to change without prior notice due to ongoing further development.

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Hints / Own Notes

Contents

1 Safety

1.1 Safety Notes

1.1.1 General Hints

» Read this operating manual before operating the projector.

» This operating manual is to be kept with the projector at all times.

» For safe and trouble free operation of the projector a good working knowledge of basic safety regulations and the projector's correct use is required.

» This operating manual contains the most important instructions for running the projector safely.

» This operating manual must be read and understood by all persons working with the projector, with particular emphasis on all aspects regarding safety.

» In addition, all valid regulations and measures concerning accident prevention must be observed.

» The owner is responsible to assure that all persons who work with and / or operate the projector are familiar with safe operating practices and accident prevention techniques and have a complete working knowledge of the projector and all additional machines and components of the system.

» Those persons who work with the projector are responsible:
- to observe safe operating practices and accident prevention techniques
- to have read and fully understand the safety chapter and the warnings within this operating manual.

» The place on which the projector will be installed must be even, solid and clean.

» Installation and basic adjustment must always be carried out by trained service personnel.

1.1.2 Dangers when Working with the Projector

Projectors are constructed according to the latest engineering and state-of-the art safety standards. The projector is only to be used for its intended purpose and is only used when functioning absolutely perfectly.

Serious danger may result from improper use of the projector, causing injury to the user or a third person, or damage may be done to the projector or other items in the vicinity.

Faults that could adversely affect safety must be rectified immediately.

The projector must not be used until any faults are rectified.

1.1.3 Intended Purpose

The projector is suitable to reproduce film images and sound.

Any other or further use is not classified as an “intended purpose”. KINOTON cannot be held liable for any damage resulting from different or extended operation.

As part of the “intended purpose” these tasks must be performed:

» observing all instructions and warnings contained in this manual

» inspecting the equipment for damage and correct function

» implementation of maintenance and repair work.

1.1.4 Guarantee and Liability

By reference KINOTON’s “General Terms of Business” apply. They are available to the customer on conclusion of sale at the latest.

Guarantee and liability claims for damage to persons and property are invalid if due to one of the following causes:

» improper use of the projector

» improper assembly, commissioning, operating and maintenance of the projector

» operation the projector with defective and / or non-functioning safety and protection devices

» activating the lamphouse via the rectifier and not via the projector

» disregarding of the instructions in the manual concerning transportation, storage, assembly, commissioning, operation and maintenance

» modification of the projector without written authorisation from the manufacturer

» connecting to power other than as specified

» failure to monitor and/or replace parts subject to wear and tear

» improper repairs

» emergencies due to influence from outside bodies or force majeure.

1.2 Explanations of Symbols and Notes

Throughout this manual you will find the following symbols:

DANGER

This symbol indicates an imminent threat of danger to life and personal health. Disregarding this warning can result in serious personal injuries or highly dangerous injuries.

ATTENTION

This symbol indicates a possibly dangerous situation. Disregarding this warning can result in small personal injuries or damage to projector.

▶ **NOTE**

This symbol indicates where notes, user tips and useful information can be found. They serve to help use the projector to its fullest.

Always wear **face protection** when changing the xenon lamp.

Always wear **protection gloves** when changing the xenon lamp.

Always wear **protection jacket (Kevlar)** when changing the xenon lamp.

1.3 Special Hazard Points

1.3.1 Electric Power Hazards

DANGER

- ▲ The access to power supply must always be kept closed. Only authorized service personnel may access this area.
- ▲ Installation according to the local electrical code and regulations an work on the electrical supply conductors or circuits must only be done by qualified technical personnel.
- ▲ This projector should be operated from an AC power source. Ensure that the mains voltage and capacity matches the projector electrical ratings. Do not defeat the purpose of the grounding.
- ▲ Do not allow anything to rest on the power cable and do not locate the projector where persons will walk on the cable.
- ▲ Do not operate the projector with a damaged cable or if the projector has been dropped or damaged - until it has been checked for operation by a qualified service technician.
- ▲ Position the cable so that it will not be tripped over, pulled, or contact hot surfaces.
- ▲ If an extension cable is necessary, a cable with a current rating at least equal to that of the projector should be used to avoid overheating of the cable.
- ▲ Do not spill liquids of any kind on this projector. If any liquid is coming into the projector, switch off, disconnect from mains and call service.
- ▲ Do not use an accessory attachment which is not recommended by the manufacturer.
- ▲ The rectifier must be exclusively enabled from projector only.
- ▲ The 4060 DC ignition unit is directly supplied via the rectifier. Therefore the lamp can be ignited by switching on the rectifier itself. Igniting the lamp by switching on the rectifier at open lamphouse can cause serious injuries and damages to the lamphouse and projector.
- ▲ The safety devices in the lamphouse (door switches and air flow switch) must not be deactivated. Safe service work on open lamphouse is possible with functional safety devices only, because rectifier and mains power will be switched off.

1.3.2 Warning Risk of Fire

DANGER

- ▲ Do not cover the projector or the lens with any material while the projector is in operation.
- ▲ In the event of fire, use sand, **CO_2**, or **dry powder fire extinguishers**; never use water on an electrical fire.
- ▲ Always have **service** on this projector performed by authorized service personnel.
- ▲ **Projection room** must be well ventilated or cooled in order to avoid build up of heat.

1.3.3 Lamphouse Hazards

1.3.3.1 Broken Glass

In cold condition the xenon lamp has an inner pressure of about 8 to 10 bar (145 psi) and in hot condition of about 30 bar (435 psi). When a xenon lamp bursts, broken glass can cause suffer injury to face, eyes and arteries. Therefore it is absolutely necessary to wear protection with open lamphouse.

DANGER OF EXPLOSION

- ▲ Never bypass a door switch.
- ▲ Only work on open lamphouse and with xenon bulb with face protection (shield), neck protection and safety gloves which reach to the elbow.
  If the xenon lamp explodes you can suffer injury to face, eyes and arteries.
- ▲ Dispose of the xenon bulb: Before removing xenon lamp put protective cover around it, pack xenon bulb in original package and give it back to your supplier.
- ▲ Only insert the new xenon bulb in protective cover. Remove cover after mounting the xenon bulb.

1.3.3.2 Ultraviolet Radiation

DANGER

- ▲ Operate projector with a closed lamphouse only.
- ▲ If you do some adjustments with an open lamphouse (look through visual hole), you have to use visual protection which blocks the ultraviolet radiation.
  Never look into light of a xenon lamp without protective glasses!

1.3.3.3 High Voltage

DANGER

Ignite xenon lamp in closed lamphouse only.

1.3.4 Mechanical Danger

DANGER

▲ Do not work around the machine with long loose hair, or loose clothing such as scarves or ties, they may get trapped in the drive mechanism and pull you in.

▲ Only open shutter housing when projector is standing still with power disconnected. If the projector is running with covers open be careful and do not touch the rotating shutter or other moving parts. Serious cuts can result.

▲ Do not put your fingers between the film track and film pressure skate or between sprockets and pad shoes.

1.4 Preventing Projector Damage

ATTENTION

△ The projector has been designed for use with a **specific lamp type**. Never use another lamp than specified.

△ In order to ensure that the projector complies with electromagnetic capability (EMC) and safety requirements, it should be always operated with all **covers in place**.

△ Do not spill **liquids** of any kind on this projector. If any liquid is coming into the projector, switch off, disconnect from mains and call service.

△ Always switch off main switch, before **cleaning** the projector housing. To keep the cabinet looking brand-new, periodically clean it with a soft cloth. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution. Never use strong solvents, such as thinner or benzine or abrasive cleaners, since these will damage the cabinet surface.

△ To ensure the highest optical performance and resolution, the projector lenses are specially treated with an anti-reflective coating. Therefore, avoid touching the coated lens surface.
To remove dust on the lens, use a soft dry cloth (Cleaning set from Kinoton).
Do not use a damp cloth, detergent solutions or thinner.

1.5 Service

ATTENTION

△ Attempts to alter the **factory-set internal controls** or to change other control settings not specially discussed in this manual can lead to permanent damage to the projection unit and cancellation of the warranty.

△ Do not attempt to **service** this projector yourself. Refer all projector servicing to a qualified Kinoton service center.

△ When replacement parts are required, be sure the service technician has used **original replacement parts** or authorized replacement parts which have the same characteristics as the original parts. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or others hazards. Unauthorized substitutions may void warranty.

△ Upon completion of any service or repairs to this projector, ask the service technician to **perform safety checks** to determine that the projector is in proper operation condition.

△ Xenon compact arc lamps are under high pressure. The lamp must be handled with great care. They may explode if dropped or mishandled. Whenever the protective cover is removed from the lamp, authorized protective clothing must be worn.

1.6 Protective Devices

All existing safety devices must be checked regularly

1.6.1 Main Switch

In case of an emergency, you can switch off the projector using the main switch (under the projector door). Push the switch to position “0”. The red lamp in the switch turns off.

1.6.2 IR Reflex Film Break Sensor

The film break sensor (arrow) switches off the projector when no film is passing the sensor (e. g. at a film break). In this case the projector will be stopped.

▶ **NOTE**

If your projector is equipped with an automation system the film break sensor can trigger a run of events.

1.6.3 Film Stripper

The film stripper (arrow) prevents film from winding around the sprocket after a film break or loss of a tape fixing has happened.

Film strippers are attached to all sprockets.

1.6.4 Lamphouse Door Switch

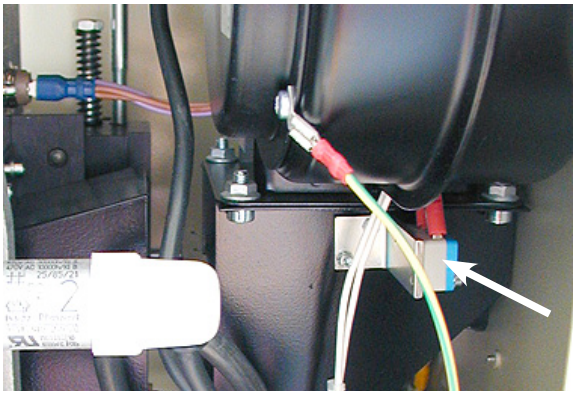
On both sides door switches (arrows) are mounted in the lamphouse frame. The xenon lamp only ignites when both lamphouse side doors are closed.

ATTENTION

Never activate the lamphouse via the rectifier.

1.6.5 Lamphouse Airflow Switch

As soon as the projector is switched on, the radial blower starts the operation. It is reasonable to cool the xenon bulb directly.
If the air flow is interrupted, the xenon lamp will be switched off by the airflow switch (arrow).
If the projector and the xenon lamp are switched off, the blower should run after about ten minutes.



2 Transportation and Installation / Mounting

2.1 Transportation

» The projector is completely (with mounted lamphouse (up to 2000 W), without lamphouse (2000 W - 7000 W) mounted on a pallet and secured with screws.

» With delivery to countries over-seas the projector secured on the pallet is packed in a wooden crate.

» The accessories are packed into a box or into the wooden crate too.

» Weight (gross): about 400 kg (882 lbs)

Storage

If the projector is stored for a longer time:

» Only store in dry rooms.

» Choose a suitable protective cover or leave projector in the original cover.

▶ **NOTE**

Although most parts are delivered with a protective cover, you have to clean the projector and its components before the first start.

2.2 Delivery or Equipment Variations

» Projector FP 50 E
- with take-up friction drive with extension arm and motor
- with take-off friction drive with extension arm
- with roller set for using with a rewind system (option)

» Lamphouse
- up to 2000 W
- up to 7000 W

» Reverse-scan sound device
- only analog, not upgradeable to Dolby Digital
- optical stereo analog, upgradeable to Dolby Digital
- optical stereo analog and Dolby Digital (option)

» Lens holder
- electronic focusing control (option)

» Lens turret (option)
- 2 lenses and manual lens change
- 2 lenses and automatic lens and aperture change
  - electronic focusing control (option)
- 3 lenses and manual lens change
- 3 lenses automatic lens and aperture change
  - electronic focusing control (option)

» Remote unit
- focusing control (option)

» Film gate cooling unit (option)

» Water cooling system (from 4000 W lamp capacity on)

» Automation system (option)
- DMP 1 Digital Matrix Programmer
- CCA3 Cue Code Automation
- SA2 Sequence Cinema Automation
- EMK 1 Electronic Automation System

» Pedestals

» Reader for DOLBY / DTS / SDDS (option)

» Rectifier
- Standard rectifier
  - 65 to 85 A
  - 75 to 95 A
  - 100 to 140 A
- Kinoton rectifier
  - KEX 110 E (up to 110 A)
  - KEX 170 E (up to 150 A)

» Film cleaner (option)

» Operating manuals

2.3 Installation

ATTENTION

△ The projector will be delivered completely wired and factory tested.

△ Only use suitable hoisting machines (crane, fork-lift).

△ Do not use unit parts as climbing aid.

△ The electrical connections have to be in accordance with local regulations and be installed professionally.

△ All installation should only be carried out by Kinoton service.

2.3.1 Place of Installation, Place of Operation

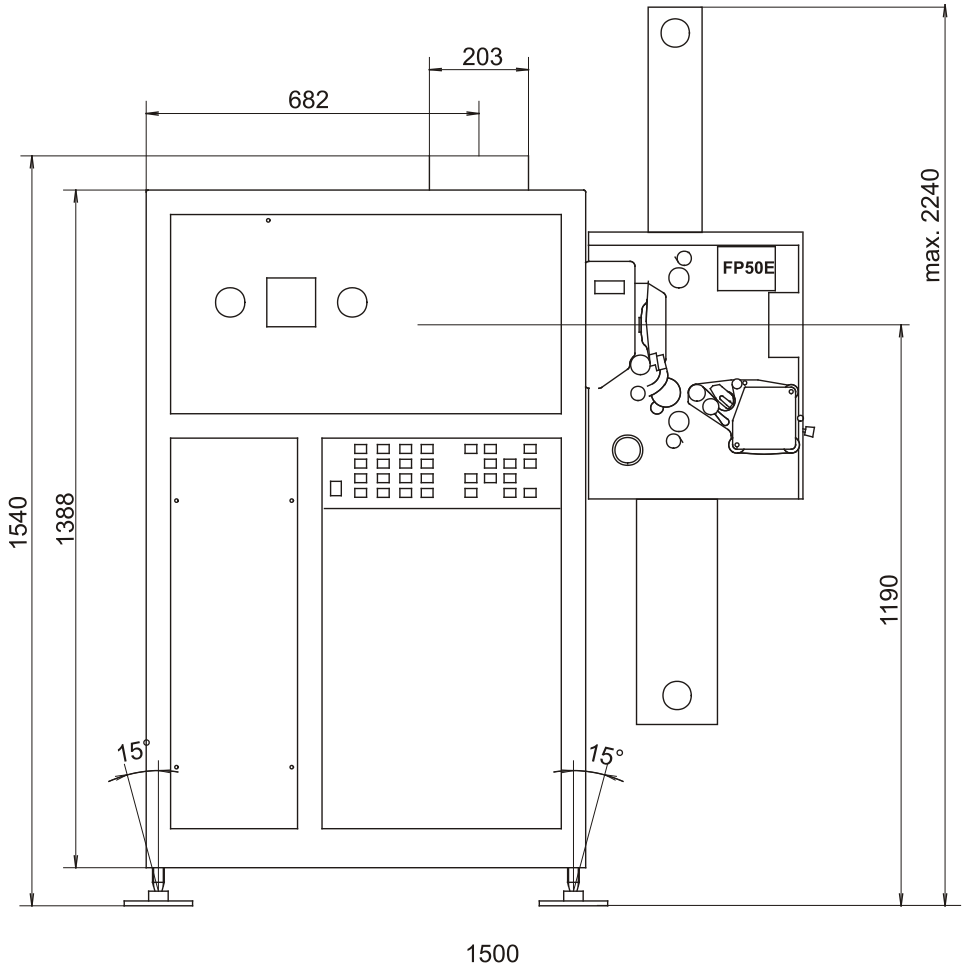
» The place on which the unit will be installed must be even, solid and clean.

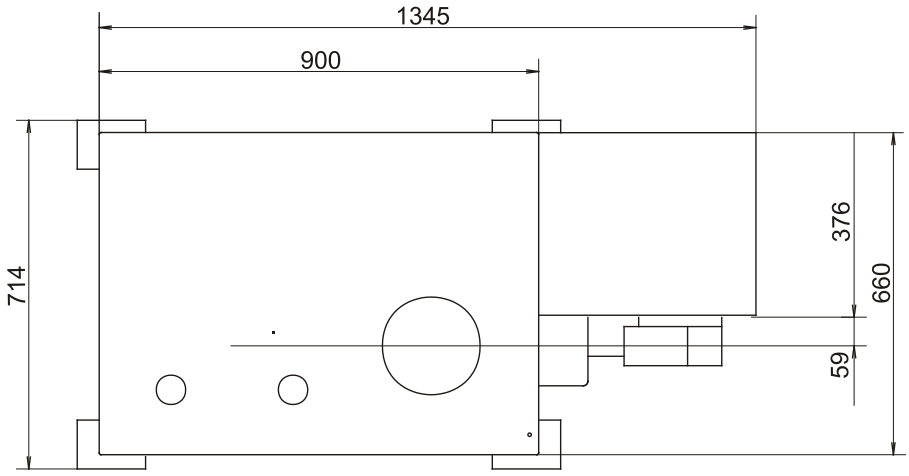
» The figure on the next page shows the projector's dimensions.

» Requirements of the projection room:
- humidity: 40 to 60 %
- temperature: 15 to 25° C
- maximum sea level: 2000 m

2.3.2 Important Hints for Installation

Projector Dimensions





2.3.3 Additional Installation Hints

ATTENTION

△ The 16^2 PE lines have to be high-flexible to derive the high-frequency ignition voltage.

△ Do not use the wires in the lamphouse cable to connect the additional dowser. Lay the dowser connection in the lamphouse tube as short as possible.

△ If you install an old building projector remove all not used old cables, wires and lines under the projector.

△ If possible the heat exchanger must not have more than 10 m distance to the projector and the refrigerating set must not have more than 15 m distance to the heat exchanger. If the environment temperature is high and the wires are long, the hose is to be isolated because of condensation.

△ The cooling water temperature has to be more than 15° C, to avoid a precipitation of condensed water on the film gate and the front gate.

2.3.4 Installing and Connecting the Lamphouse Components

▶ **NOTE**

▷ Connecting the lamphouse should be carried out by service personnel.

▷ The installation and adjustment of the xenon bulb and the adjustment of the intensity of currents is described in chapter 6.4.11 and further on.

▷ The mirror should only be installed and adjusted by trained service personnel. The reflector should only be changed and adjusted roughly by the projectionist in case of need, therefore see chapter 6.4.16.

▷ Installing the heat filter is described in chapter 6.4.17.

▷ You will find the lamphouse connecting plan in chapter 8.3.4.

2.3.5 Connecting the Water Cooling (option)

ATTENTION

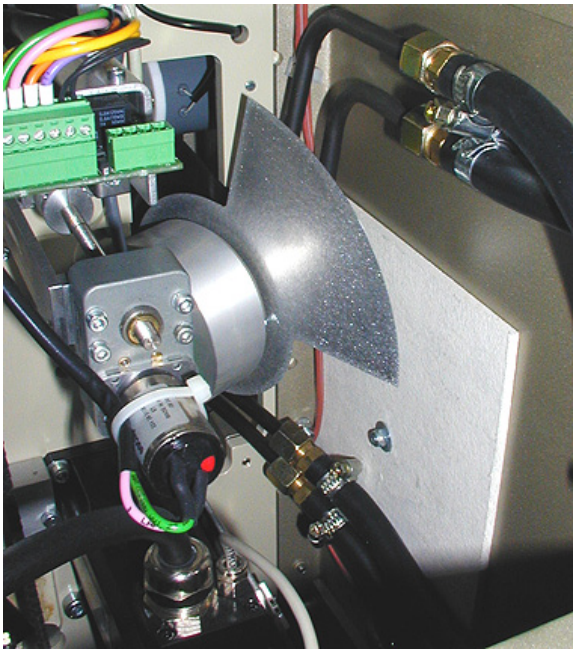
△ A water flow of 2 to 3 l/min is needed to get a water temperature of 18° C ± 2° C (64° F ± 10° F).

△ The water temperature should not be less than 16° C, otherwise water can condense on pipes, cables and film running components and finally results in damage of the film material. At bad conditions dropping water can damage the electronics.

△ If possible the heat exchanger must not have more than 10 m distance to projector and refrigerating set must not have more than 15 m distance to heat exchanger. If environment temperature is high and wires are long, the hose is to be isolated because of condensation water.

△ At bad climatic conditions (high temperature, high humidity) condensation can also occur above 16° C - in this case please check the projector.

- Connect the inlet and outlet tubes of the water cooling system to the connecting pieces in the projector.



▶ **NOTE**

You will find the description of the water cooling unit in the corresponding operating manual.

2.4 Connecting the Projector

Connect the projector to the mains current (insert the plug):

» 230 / 400 V or

» 120 / 208 V.

▶ **NOTE**

You will find plans of terminal connections in chapter 8.2.

2.5 Connecting the Non-Rewind System to the Projector

Install the non-rewind system.

▶ **NOTE**

▷ You will find plans of terminal connection in chapter 8.2.

▷ For more information, see platter system's operating manual.

▷ The roller set of the film guidance between projector and non-rewind system should not be mounted until the projector has its final position to the screen.

3 Function and Components

3.1 Components Overview

3.1.1 Projection Drive

The FP 50 E console projector is suitable to reproduce 35 mm films and sound formats in small, medium and large cinemas.

» The film is transported through the projector from the top to the bottom.

» The projector head can be equipped with flange connected spool arms up to a capacity of 2000 m. The take-up friction is driven via a toothed belt from the main drive motor.

» The film can also be guided via a set of guide rollers to and from the non-rewind system.

» Depending on the requirement an automation system can be integrated in the projector housing.

» In the housing there are also the xenon unit (two types) and the rectifier.

» The reverse-scan sound device is directly mounted on projector head and is suitable to reproduce analog sound and digital sound DOLBY SR·D. Both sound formats in shape of readers can be combined in one equipment.

» Optionally the projector can be equipped with DTS or SDDS reader (Sony). Both readers can be attached on an extension arm at the top of the projector head.

3.1.2 Console

» The projector head with frictions or/and set of guide rollers and sound device are mounted on the console.

» Drives and motors are mounted in the projector head.

» The whole electrical equipment, the rectifier, the xenon unit, the sound amplifiers and the automation systems can be mounted into the console.

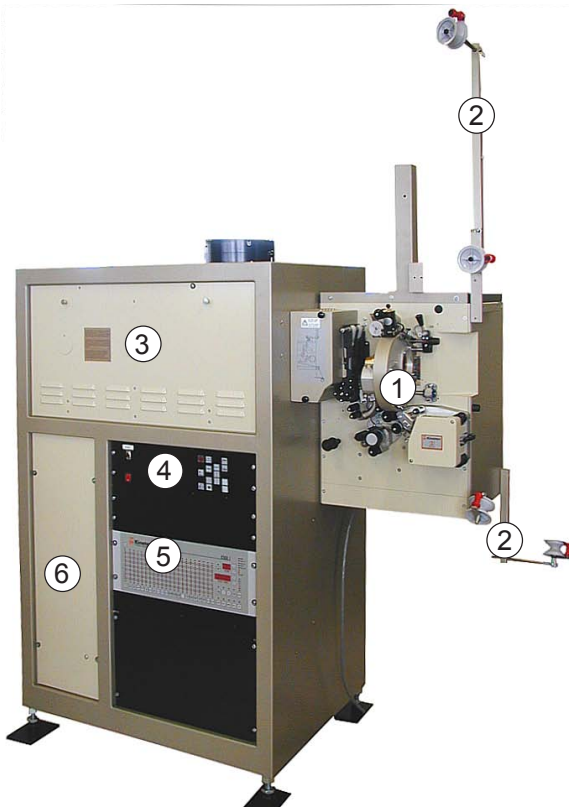
3.1.3 Xenon Unit

» The projector can be equipped with two types of xenon units (1,000 to 2,000 W and 2,000 to 7,000 W).

» Two electrodes produce a light arc in a surrounding of pure xenon gas between each other. The light arc will be reflected via the mirror and lights through film gate, the film and in result the screen.

» A rectifier provides the xenon lamp with power.

3.1.4 FP 50 E Variations



Operation with a platter system

① Projector head

② Extension arms with guide rollers for running with a platter system

③ Lamphouse

④ Operating panel

⑤ Electronic components / rectifier / automation system (here EMK 1)

⑥ Electronic components

Operation with film spools

① Projector head

② Extension arms for film spools

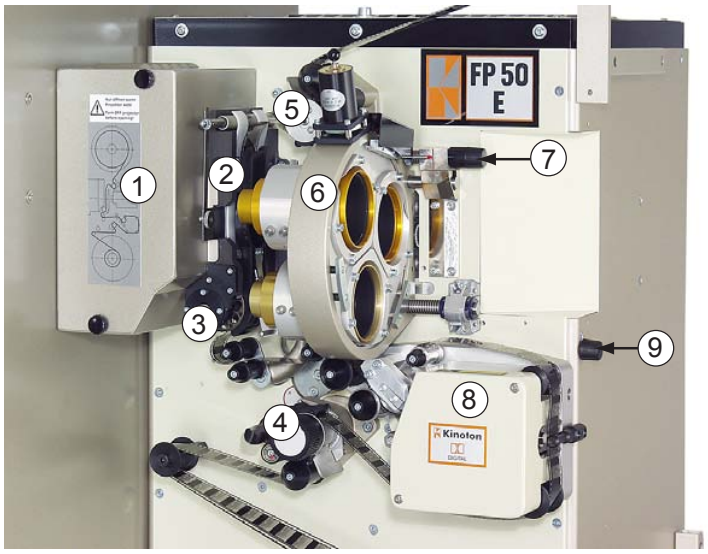
③ Lamphouse

④ Operating panel (here extended)

⑤ Electronic components / rectifier / automation system (here EMK 1)

⑥ Electronic components

3.1.5 Projector Head



① Shutter housing

② Film gate with film pressure skate and aperture changer (option)

③ Intermittent sprocket

④ Bottom / holdback sprocket

⑤ Feed sprocket

⑥ Lens turret (option)

⑦ Focusing knob

⑧ Reverse-scan sound device

⑨ Skate pressure adjusting knob

3.2 Film Gate and Film Track

In the film gate the film is positioned precisely. By adjusting the film pressure skate you can optimize the picture steadiness.

After threading the film, close the film track with the film pressure skate to guide the film. The four ceramic rollers guide the film laterally.

① Shutter housing
② Film gate
③ Film runner strips (2)
④ Ceramics roller (4)
⑤ Film pressure skate 35 mm
⑥ Intermittent sprocket
⑦ Aperture changer (option)

3.2.1 Film Pressure Skate

For smooth and silent film running it is very important that the pressure of the film skate is adjusted accurately.

▶ **NOTE**

▷ Adjusting the film pressure skate, see chapter 6.4.2.

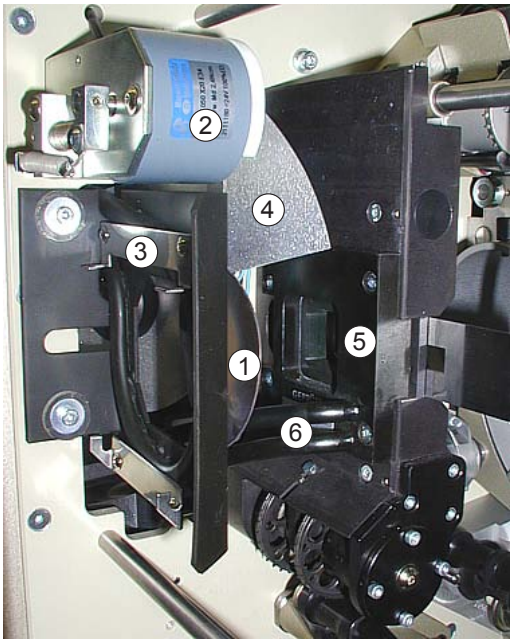
▷ Adjusting the height of the film pressure skate, see chapter 6.4.3.

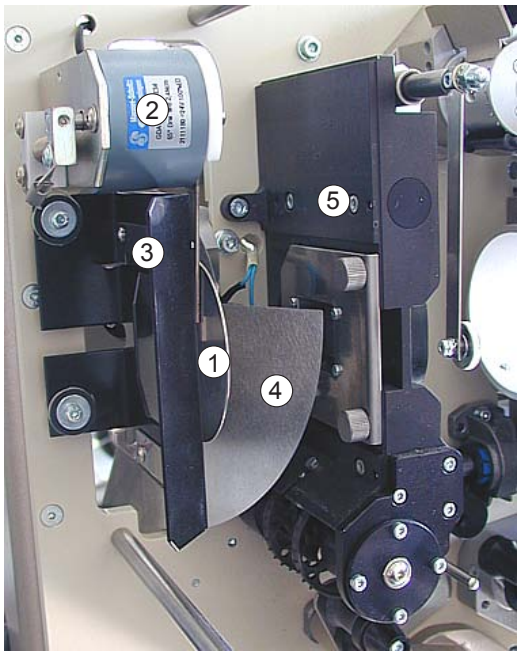
▷ Changing the film runner strips, see chapter 6.4.4.

3.2.2 The Dowser

The dowser opens or closes the path of xenon light to the film gate.

Opening the dowser can be done by pushing the corresponding button on the operating panel or automatically controlled by an automation system and a cue foil on the film.





① Dowser

② Dowser rotation solenoid

③ Light baffle

④ Rotary shutter

⑤ Film gate with water cooling unit or fire protection plate

⑥ Water cooling unit

ATTENTION

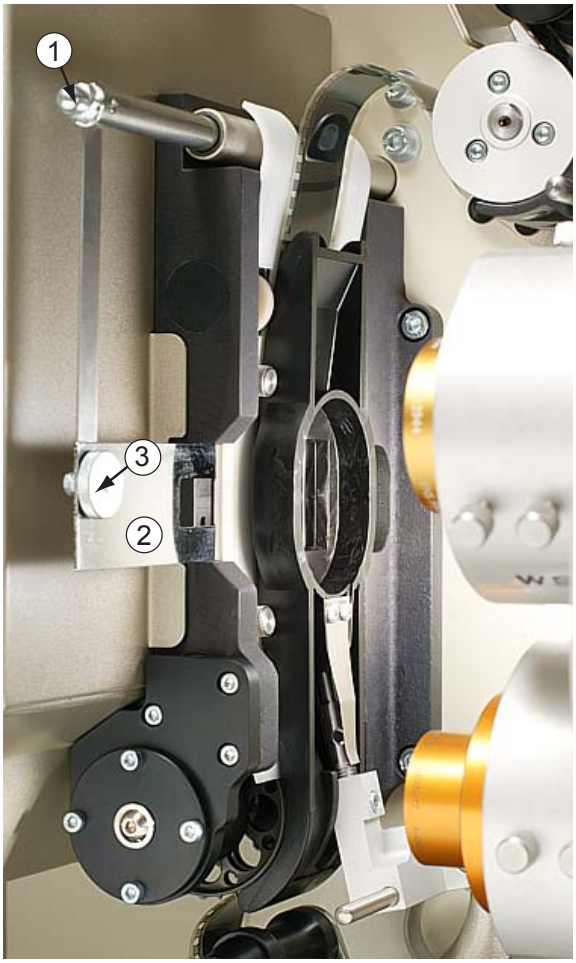
If the dowser does not close while the projector is stopped the film will burn.

3.2.3 Single Aperture Plates (only with manual lens turret or lens holder)

Push the single aperture plate into the film gate until the stop is reached and the aperture plate snaps into position.

3.2.4 Aperture Changer (option, only with electronic lens turret)

The aperture changer is suitable for automatically changing the aperture when the corresponding format key has been pressed. It works together with an electronically controlled lens turret. By activating a format button the aperture together with the lens is changed.

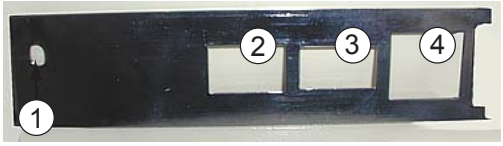


① Aperture changer

② Aperture

③ Drive pin
(with knurled nut installed)

- Push the aperture into the film gate and place the aperture changer drive pin into the hole on the aperture.
- Tighten the knurled nut on the drive pin.



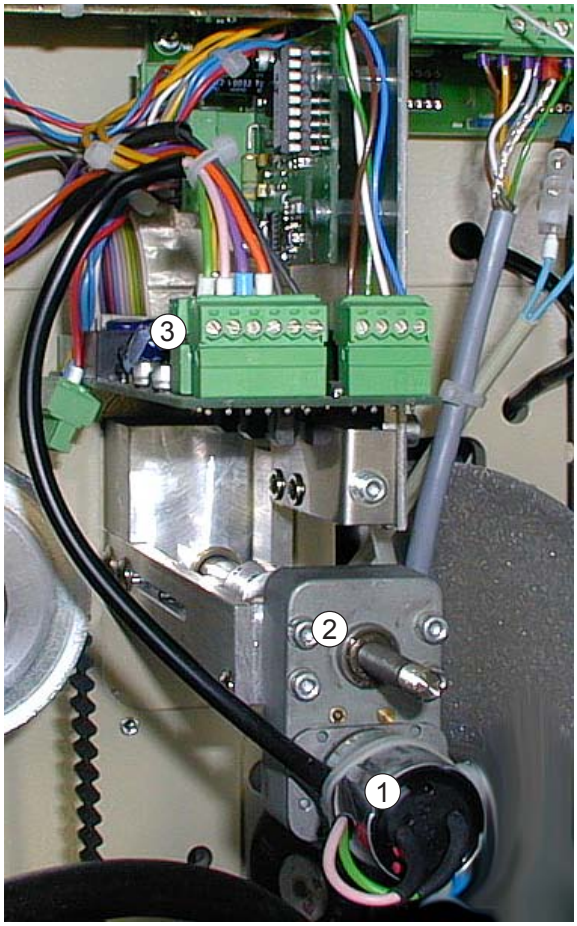
① Hole for drive pin

② 1:1.66 aperture

③ 1:1.85 aperture

④ 1:2.39 aperture

3.2.4.1 Drive and Control



① Aperture changer motor

② Aperture changer drive

③ Aperture changer/lens turret control board

3.2.4.2 Format Change with Three Lenses

- Push CS, WS or NS on the operating panel.

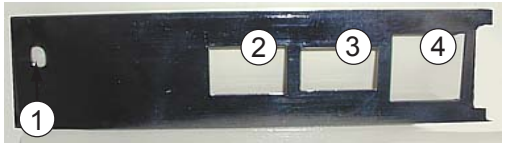
☛ The aperture changer places the selected aperture into the film gate and the matching lens in position.

3.2.4.3 Format Change with Two Lenses Turret

- Push WS or CS on operating panel (if existing).

☛ If the lens turret is equipped with two lenses and the aperture has three openings you can select any two of the three aperture openings to work with the two lenses. For example for some shows the format change could be between CS (Cinema-Scope) and WS (1:1.85) and for other shows the format change could be between WS (1:1.85) and NS (1:1.33).

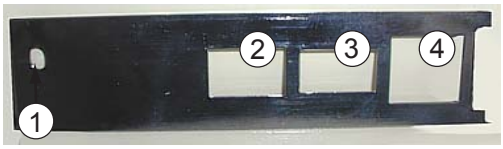
The following format combinations are available:
- format combination ② and ③ or
- format combination ③ and ④ or
- format combination ② and ④



3.2.4.4 Changing the Format Combination

- The “select” function is activated by holding the SELECT control closed more than 2 seconds.

☛ The turret will not rotate. The turret solenoid makes a clattering sound which means that a new format combination has been selected.



☛ The format combination changes to the next combination, for example:
- from ② and ③ to ③ and ④.
If you activate the “Select” input again the format combination will be changed again, for example:
- from ③ and ④ to ② and ④ and so forth. After the “Select” input was selected three times, the combinations repeat.

▶ **NOTE**

Check your selection and push WS (flat) or CS (scope) button. The turret turns to the selected lens and the aperture changer changes to the selected aperture.

▶ **HINT**

Make a note which shows you which aperture combination is chosen after how many times he SELECT button was pushed.

▶ **NOTE**

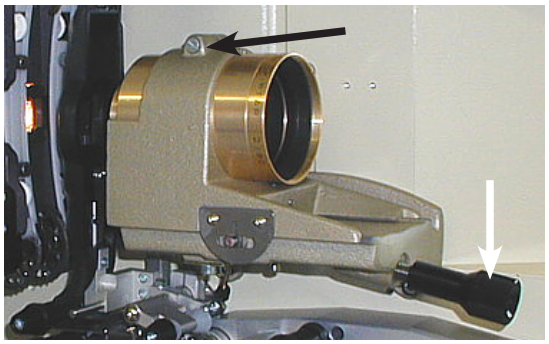
▷ Changing the aperture changes the lens too, see also lens turret, chapter 3.2.6.2.

▷ If the projector is equipped with an aperture changer do not push single aperture plates into the slit, because there is no stop and lock device for that aperture plate.

3.2.5 Lens Holder

The lens holder can be fed with a lens.

- For inserting a lens loosen clamping screw (black arrow), put in the lens and then tighten the screw again.
- Focusing can be done manually (white arrow or optionally electronically.



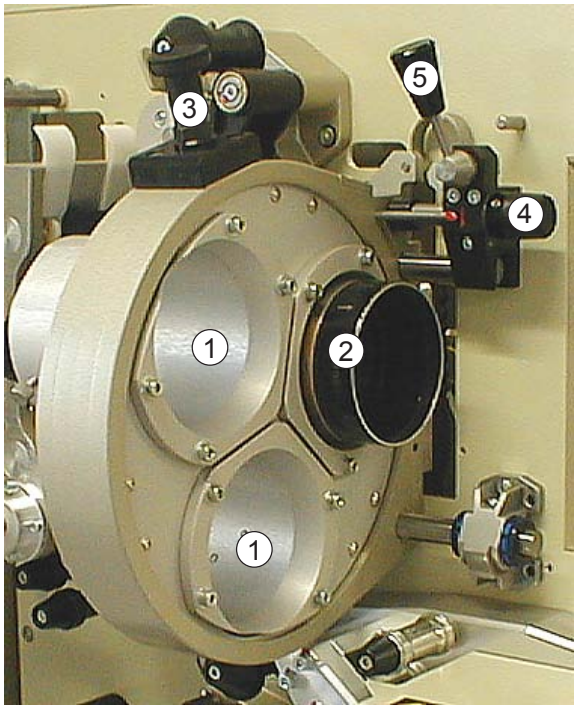
▶ **NOTE**

Adjusting the lens holder, see chapter 6.4.5.

3.2.6 Lens Turret (option)

The lens turret can hold two or three lenses. By turning the turret the needed lens can be positioned in front of the film gate. This can be done manually or electronically controlled.

3.2.6.1 Manual Lens Change



① Lens tubes

② Lens in lens tube

③ Handle (arresting pin)

④ Focusing knob (manual)

⑤ Position lever for moving the lens turret away from the gate

- For inserting a lens loosen the knurled screws and push the lens into the lens tube.

☛ The tubes are labelled for a suitable lens: CS (1:2.40), WS (1:1.85) or NS (1:1.33).

- Precisely focus each lens in its tube by moving the lens in its tube and without adjusting the focus knob.
- Then fasten the lens with the knurled screw.

▶ **NOTE**

Some lenses may require rings to support the rear section; these are available from Kinoton.

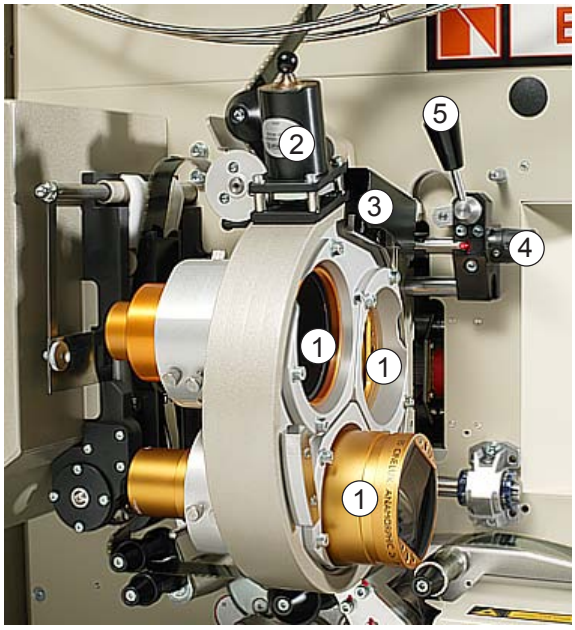
- For easy film threading flip the position lever - the lens turret will move away from the film gate. **Make sure to put the lever fully back in position before projecting!**
- To rotate a lens into position, pull out the handle and turn the lens turret to the desired position. Let handle drop – lens turret is positioned.

▶ **NOTE**

It is possible to set the handle so it remains up so that the turret can continuously rotate. This position is not used for normal operation.

3.2.6.2 Electronically Controlled Lens Change (option)

The electronically controlled lens turret is suitable to change the lens automatically when the corresponding format key has been pressed. Simultaneously the applicable aperture is changed too.



① Lens tubes with lenses

② Latching solenoid

③ Sensor board (covered)

④ Manual focusing

⑤ Position lever for moving the lens turret away from the gate

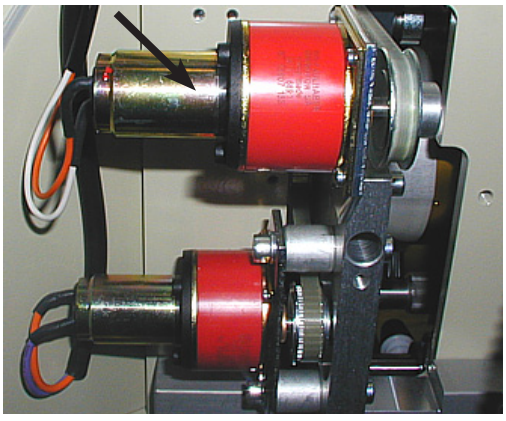
- To select a lens, push one of the format buttons.

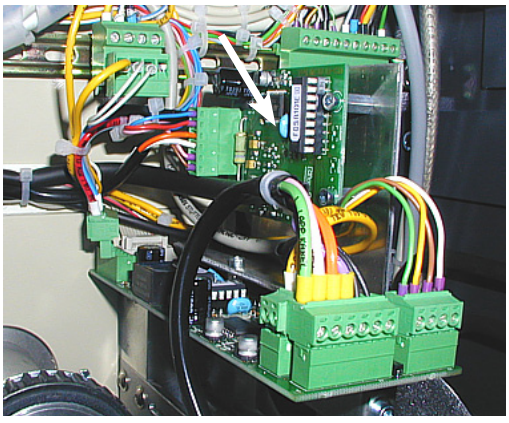
☛ The light barrier on the sensor board senses the position of the corresponding coding plate (one coding plate for one lens).

☛ The lens turret will stop at that position and be magnetically latched.

Drive and Control

The lens turret/aperture changer control board (arrow, right figure) activates the turret motor (arrow, left figure), which changes the lens via a toothed belt.





▶ **NOTE**

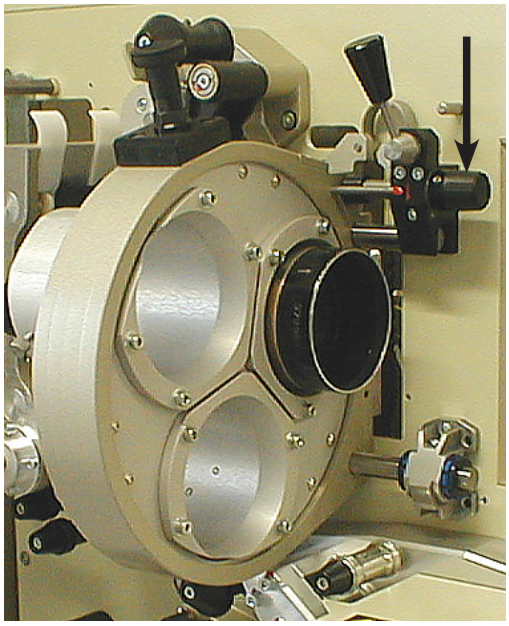
▷ When changing the lens the aperture is changed too (see also chapter 3.2.4).

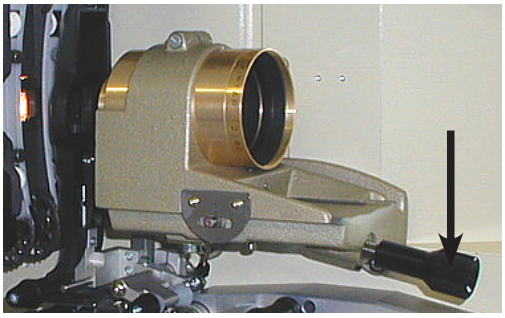
▷ Initializing the EE-PROM should be only carried out by experts.

3.2.7 Focusing

To adjust the focus for a sharp picture on the screen, you have to move horizontally the whole lens turret or lens holder. This operation can be done manually or electronically controlled.

3.2.7.1 Manual Focusing with Lens Turret / Lens Holder





- Turn the focusing knob (arrows) to move the lens turret or the lens holder.

3.2.7.2 Electronic Focusing with Lens Turret (option)

Pushing the focusing buttons triggers the control board (placed over the aperture changer/lens turret board or separate over the focus motor) to activate the turret motor (placed over the lens turret motor or separate), which shifts the lens turret via a toothed belt driving a threaded shaft.

▶ **NOTE**

Electronic focusing can only be carried out with open dowser.

3.2.7.3 Electronically Controlled Lens Holder Focusing (option)

When operating the focus controls, the focus motor rotates a shaft with a eccentric segment at the end. That eccentric is located between the focus shaft and the lens holder and thus shifts the lens holder fore and aft as it rotates.

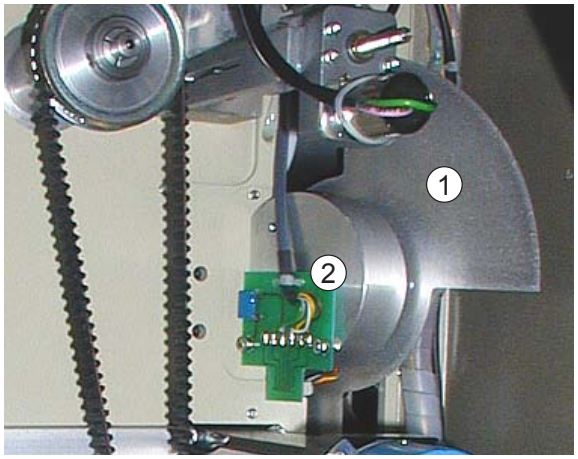
▶ **NOTE**

Electronic focusing is only carried out with open dowser.

3.2.8 Rotating Shutter

The rotating shutter interrupts the projection light once during the film transport and once during the picture standstill. (48 interruptions a second at 24 pictures a second).

The shutter is driven by an electronically controlled motor.



① shutter (2-blade)

② shutter drive

DANGER

Only remove or replace the shutter housing when the projector is off.
If you have to work on the projector while it is running be very careful that you do not touch the rotating shutter. Serious cuts can result.

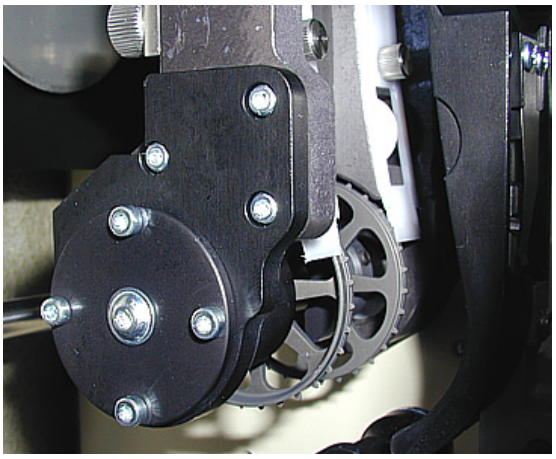
▶ **NOTE**

The shutter is factory-set. Adjustments should only be carried out by service staff.

3.2.9 Intermittent Sprocket

The intermittent sprocket is a very precise sprocket. It transports the film step by step through the film gate.

The intermittent sprocket is controlled by the PREMIERE drive unit.



▶ **NOTE**

The sprocket is factory-set.
All adjustment must only be carried out by experts.

3.2.10 Framing

Framing allows to position the picture frame in the film gate by moving the film upwards or downwards.

Press and hold the  or  button to adjust the frame continuously up or down.

3.2.11 Constant Speed Sprockets

Sprockets are designed to transport the film continuously. The teeth of the sprocket engage the perforations of the film. Both sprockets provide for equal loops before and after the film gate.

① Feed sprocket / bottom or holdback sprocket

② Pad shoe with handle

③ Ring nut with spring

④ Film stripper

⑤ Guide roller

⑥ Hand wheel

» The feed sprocket (left figure) pulls the film from the take-off friction or platter to the film gate.

» The bottom sprocket (right figure) pulls the film out of the sound head and feeds it to the take-up friction or platter.

» The pad shoe holds the film on the sprocket.

» The film stripper prevents broken film from being wound up around the sprocket.

» With the handle you can open the pad shoe to thread the film.

▶ **NOTE**

▷ Changing a constant speed sprocket and a pad shoe, see chapter 6.4.6.

▷ Adjusting the tension of the pad shoe spring, see chapter 6.4.7.

▷ Adjusting the distance between the pad shoe and the sprocket, see chapter 6.4.8.

▷ Adjusting the film break sensor, see chapter 6.4.9.

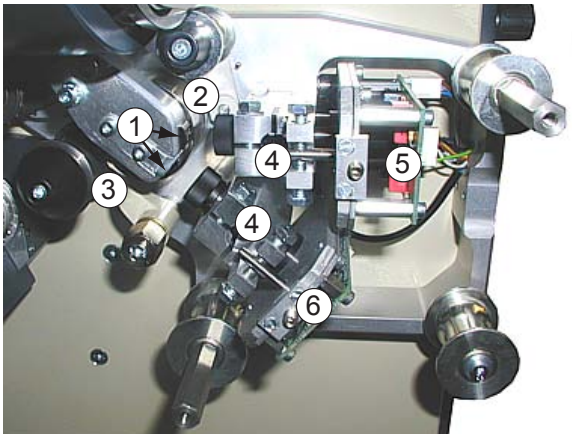
3.3 Reverse-Scan Sound Device (analog and optional DOLBY digital / upgradeable)

Reverse-scan sound devices scan the sound track (analog and optional DOLBY digital) on the film via red LEDs. An only analog sound device is upgradeable with DOLBY digital.

▶ **NOTE**

- ▷ The reverse scan sound head is delivered factory checked and adjusted.
- ▷ Optional cue sensors for reading metal foil tapes can be mounted in the reverse scan sound device.

3.3.1 Components



① LED holder with optional second digital LED

② Sound shaft (drum)

③ Sound pressure roller

④ Analog (upper) and optional digital (lower) sound optics

⑤ p. c board with solar cell (analog)

⑥ p. c. board with CCD-unit (digital)

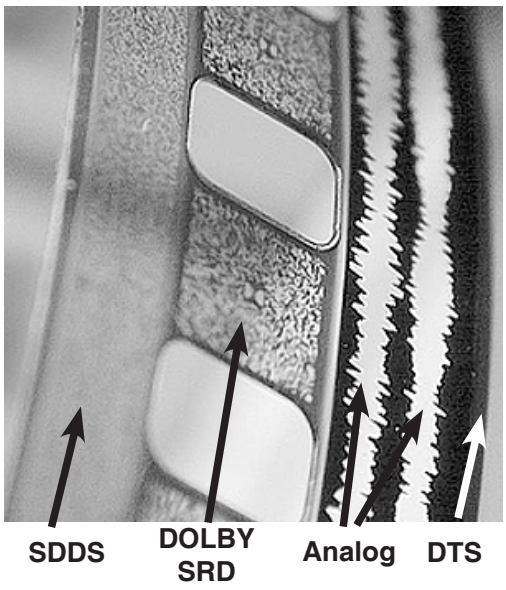
3.3.2 Sound Tracks on the Films

Analog sound is printed as two wavy lines on the film.
The height of the amplitude signifies loudness, frequency signifies pitch.

The **Dolby digital sound** information (DOLBY SR·D) is encoded between the perforations.

The **DTS digital sound** information is encoded between the picture and the analog sound track.

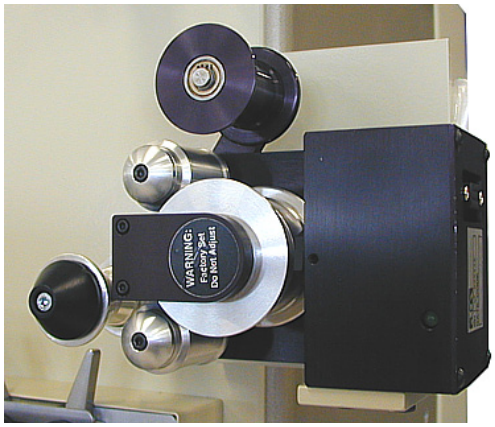
The **SDDS** information is encoded on the edges of the film.



3.4 DTS/SDDS Reader

Optionally a DTS (see figure) or SDDS reader can be used to scan the corresponding sound track on the film.

The readers will be fastened with special holders on the projector.



3.5 Film Cleaner (option)

Optionally the projector can be equipped with a film cleaner.

3.6 Film Transport Systems

3.6.1 Friction Shafts with Film Spools

A friction is a shaft, which is driven with a constant turning moment.

Take-off friction (non-driven)

This “take-off clutch” provokes that a certain traction force is necessary to wind off the film.
This friction prevents spinning of the film spool in case the projector suddenly stops which would cause film clutter – in the worst case the film material could be damaged or even break.

Take-up friction (driven)

As it is with the take-off friction where the braking force is regulated the film tension can be controlled by the take-up friction. The take-up shaft is driven via a toothed belt by the main drive motor.
- Is it too strong, it brings too much tension to the sprocket which can lead to perforation damages.
- Is it too weak the film will be wound too loose. This can lead to film damages during rewinding (scratches, etc.).
- Furthermore the take-up friction must work quietly as it also would lead to periodically occurring damages at perforation (at the sprocket) or even lead to yowling with optical sound.

Frictions shafts:

- 9 mm (DIN)
- 7.92 mm (5/16“)
- 12.7 mm (1/2“)

▶ **NOTE**

▷ Depending on the frictions (from 600 up to 2000 meters) the film tension has to be adapted.

▷ The film tension is inversely proportional to the reel diameter:
The film tension is less, when the reel diameter is large.

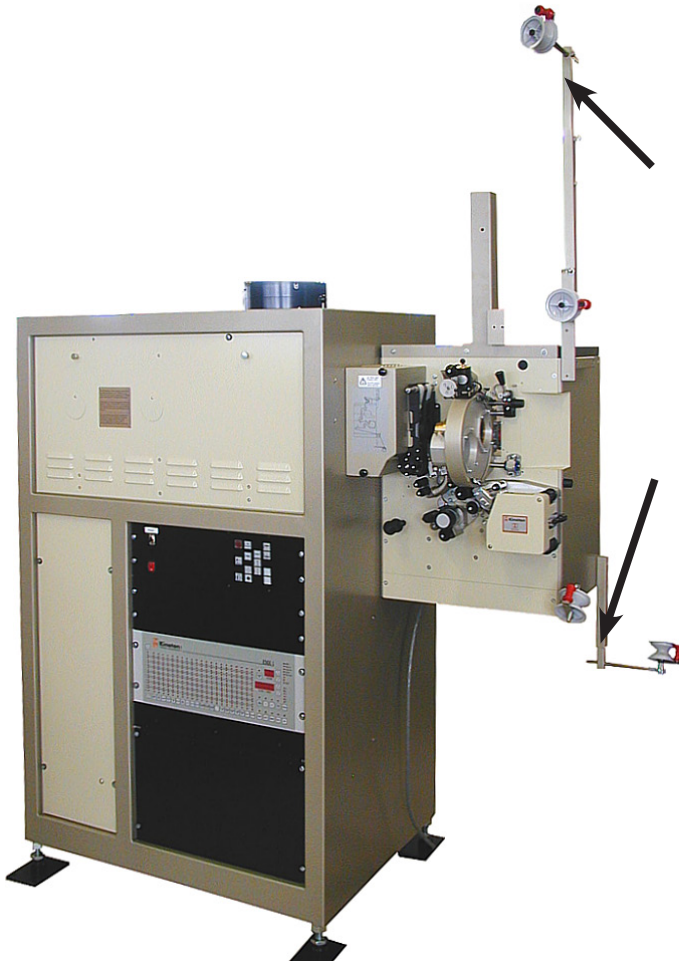
▷ Adjusting the friction, see chapter 6.4.10.

▷ Changing the felt disk of the friction is described in chapter 6.4.11.

▷ Tension the toothed belt is described in chapter 6.4.12.

3.6.2 Guide Roller Set for Operation with a Platter System (option)

For operating with a non-rewind system a set of guide rollers on extension arms can be mounted on the projector head.
- The extension arms of guide rollers are adjustable in length.
- The guide rollers are movable and can be tilt according to the film guidance.



▶ **NOTE**

Optionally the projector can be equipped with frictions and extension arms with guide rollers for operation with a platter system.

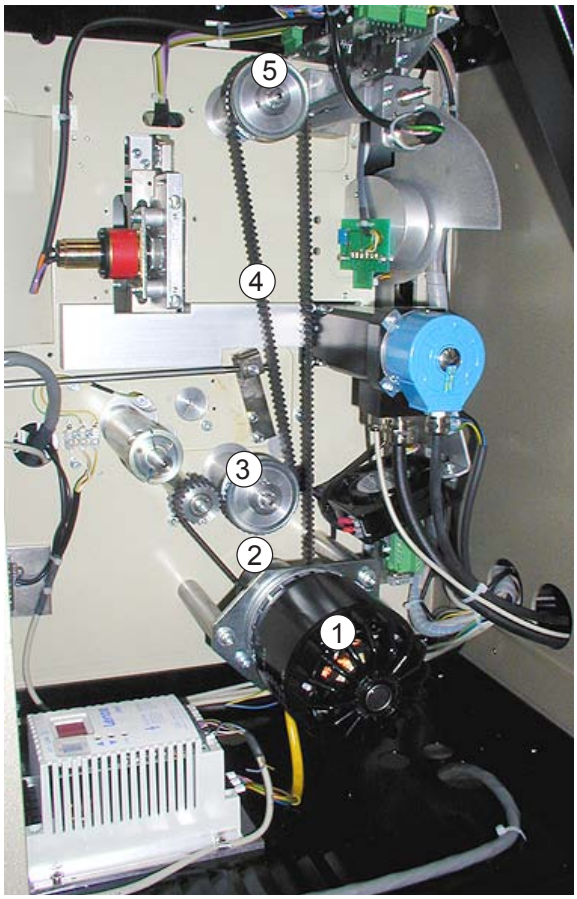
3.7 Drive Components in the Projector Head

▶ **NOTE**

▷ In this chapter you will get an overview of the drive components.

▷ All work on drives should be carried out by experts.

3.7.1 Main Drive



① Main drive motor

② Main drive encoder

③ Bottom sprocket shaft and gear

④ SuperTorque drive belt

⑤ Feed sprocket shaft and gear

Via gears and the belt the following shafts are driven by the main drive motor ①:

» Encoder shaft ②

» Feed sprocket ⑤

» Bottom sprocket ③

» Take-up friction shaft (option)

The main drive encoder ② is directly positioned behind the main drive motor on their common shaft.

3.7.2 PREMIERE Intermittent Sprocket Drive

Via pulses the main drive encoder counts quantity of film (transport unit = 1 picture), which is transported out of feed sprocket into film gate.
If one “transport unit” is completely counted and shutter position is dark the motor of intermittent sprocket carries on film for one picture.
This operation is controlled by a microprocessor which is mounted on main board.

3.8 Electronic Components

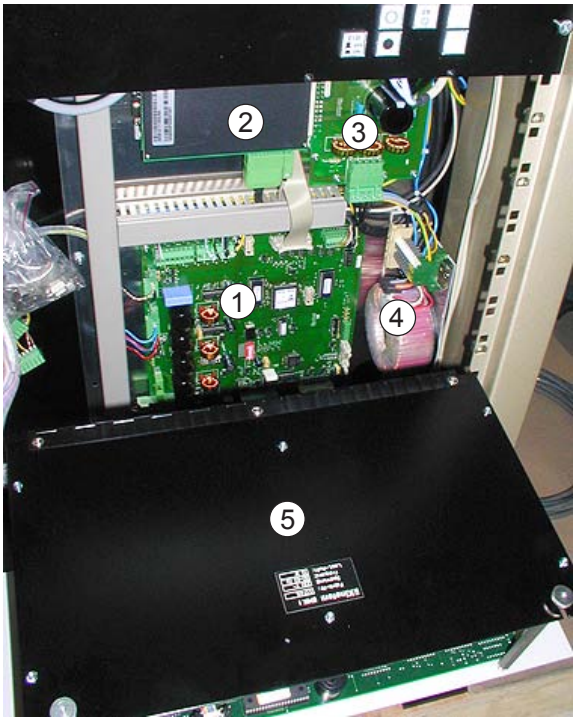
▶ **NOTE**

▷ In this chapter you will get an overview of the electronic components, which are mounted in the projector console.

▷ The console door should only be opened by authorized service staff.

▷ All work on electronic parts must be carried out only by experts.

3.8.1 Main Board and PREMIERE Intermittent Sprocket Drive in the Projector Console



① Main board

② FPS 300 amplifier

③ Power supply unit for FPS 300

④ Mains transformer

⑤ EMK 1 automation system (option)

The **main board** is the projector’s control center. It provides:

» DIP switches for setting projector functions

» LEDs for, e. g. shutter adjustment indication or voltage error indication

» Interfaces for different connections.

3.8.2 Other Electrical Components in the Projector Console

① X1 main terminal strip
② Internal terminal strip with main fuse 6.3 A
③ Relays: RUN, C/O, XENON
④ Mains contactor
⑤ Fuse 10 A
⑥ Overload release 40 A
⑦ Interface board
⑧ Mains filter
⑨ Current at make limiter
⑩ LED power supply board
⑪ Error I/O board for pager system (option)

The **LED board** can be designed for analog and digital sound LED's supply or for analog LED's supply only.

The LED board is powered via the projector with 24 V.

3.8.3 Rectifiers

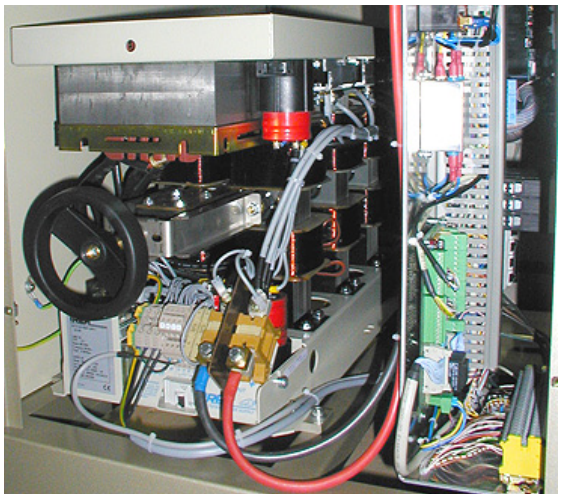
The rectifier supplies the xenon lamp with regular current. The needed intensity of currents for the rectifier (type) depends on the xenon unit.

Standard rectifier

The rectifier is placed in the console.

The standard rectifier are available with power of:
- 65 to 85 A
- 75 to 95 A
- 100 to 140 A

The intensity of current for the xenon lamp is adjustable by turning the hand wheel on the projector housing - the rectifier iron core will be moved. The adjusted intensity of current is displayed on the ammeter.



Kinoton KEX 110 or KEX 170 Rectifier

The electronic Kinoton rectifier are available with a power up to:
- 110 A (KEX 110)
- 170 A (KEX 170)
for use for different mains voltages.

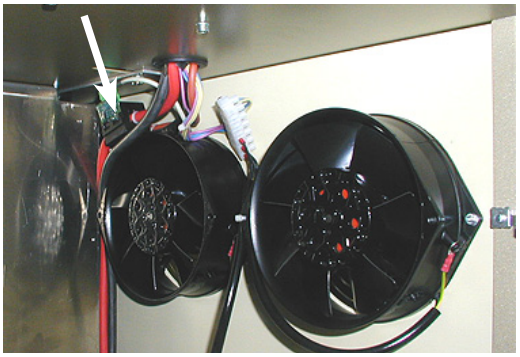
The intensity of current for the xenon lamp can be set by turning a potentiometer or via the LDU unit's program.

▶ **NOTE**

You will find a more detailed description of the rectifier in the corresponding operating manual.

3.8.4 Xenon Sensor (option)

The xenon sensor (arrow) monitors the function of the xenon bulb. The Hall sensor is closed in a ferrite core. This ferrite core is closed around the xenon lamp mains cable. If the xenon bulb does not illuminate during a running program, the sensor transmit this error to the EMK 1. The EMK 1 beeps and shows "Lfl" in the display.



3.8.5 Automation Systems

The projector can be equipped with the different automation systems.

» If the FP 50 E is running with the EMK 1 automation system the projector is equipped with 1 sensor to read the cue foils.

» If the FP 50 E is running with the DMP 1 automation system the projector is equipped with 1 sensor to read the cue foils.

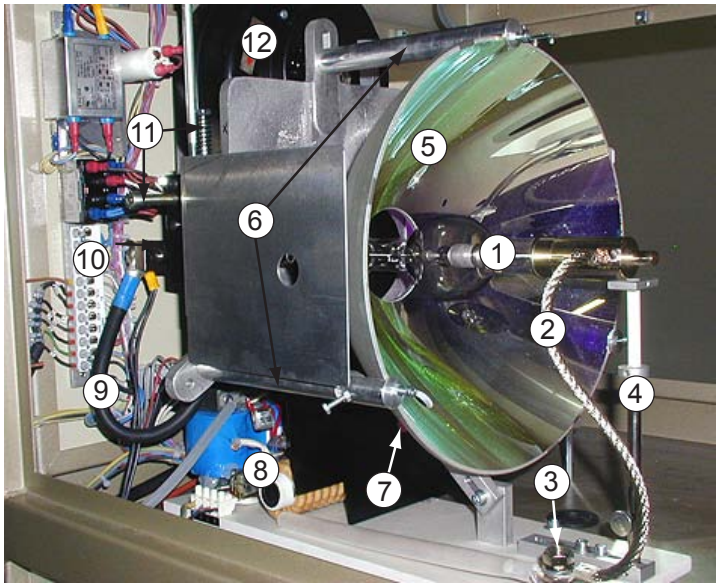
» If the FP 50 E is running with the CCA 3 automation system the projector is equipped with 3 sensors to read the cue foils.

» If the FP 50 E is running with the SA 2 automation system the projector is equipped with 2 sensors to read the cue foils.

▶ **NOTE**

See the corresponding operating manual for more information.

3.9 Lamphouse Components



① Xenon bulb

② Anode (+) cable

③ Anode connecting bolt

④ Bulb support (up to 7,000 W only)

⑤ Mirror

⑥ Mirror holders and protection shield

⑦ Stabilizing magnet

⑧ Ignition base

⑨ Cathode (-) cable

⑩ Terminal strip

⑪ Mirror adjustment screws

⑫ Fan

DANGER

▲ The xenon lamp can only be ignited, when the lamphouse door is closed. If you open the door during the operation the door switch will be activated and the xenon lamp will turn off immediately.

▲ You can suffer hurts when broken glass is flying around (xenon bulb has an inner pressure of 8 to 10 bar in cold condition and about 30 bar in hot condition). Because of that you have to wear a protective suit, protective gloves and a face/ neck protection during all works with lamphouse open.

3.9.1 Xenon Unit

» The xenon unit consists of: reflector with holder, xenon bulb support and adjusting units, mounting plate with starter gap, ignition unit, stabilizing magnet with holder and fan.

» Two different xenon units for the following xenon lamps are available:
- 1,000 W to 2,000 W
- 2,000 W to 7,000 W

▶ **NOTE**

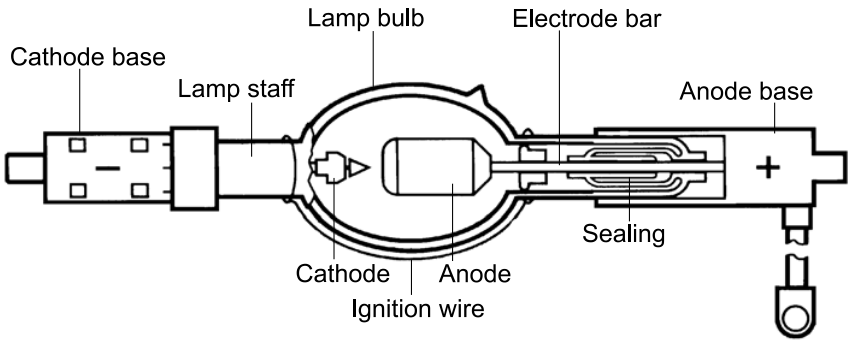
▷ The xenon unit is factory-set positioned at the back of the lamphouse.

▷ The adjustment of the optical axis has to be carried out by authorised experts or service personnel from KINOTON.

▷ The small xenon unit can be equipped with xenon bulbs 1,000 to 2,000 W which will be easily screwed in.

▷ The big xenon unit can be equipped with xenon bulbs 2,000 to 7,000 W. To install them an adapter has to be put on the cathode base. The bulb with the attached adapter will be fastened by turning an Allen screw from the lamphouse outside.

3.9.2 Xenon Bulb



The lamp bulb out of quartz glass encloses the electrode system and the xenon gas. The discharge arc burns between the anode (+) and the cathode (-).
The cathode delivers the electrons. The anode takes off the electrons. The resulting brake energy will be transformed into heat energy and then reflected. The discharge arc (light arc) is stabilized through a magnet.

▶ **NOTE**

Changing and disposing of the xenon bulb, see chapter 6.4.13.

3.9.3 Mirror

Nowadays cold mirrors are mostly used. Because of their coating, heat can diffuse the mirror – the film gate gets a less range of heat but the full range of light.

The following mirrors are available:

» Xenon unit 1,000 W to 2,000 W, Ø 300 mm

» Xenon unit 2,000 W to 7,000 W, Ø 340 mm

ATTENTION

Do not touch the inside of the mirror with bare hands. If necessary carefully remove fingerprints with an alcohol-soaked cloth.

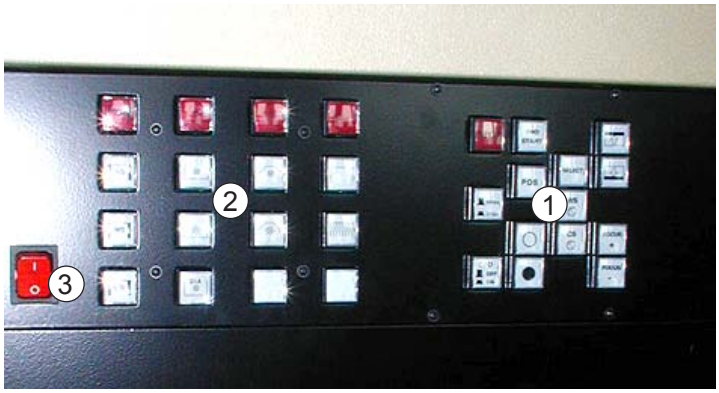
▶ **NOTE**

▷ The mirror should only be changed by trained service personnel.

▷ The reflector should only be changed and adjusted roughly by the projectionist in case of need, therefore see chapter 6.4.17.

4 Operating Elements

4.1 Projector Console



① Projector operating panel

② Auditorium operating panel (option)

③ Main switch

▶ **NOTE**

The operating panels can differ corresponding to the automation system and/or remote control.

4.1.1 Main Switch

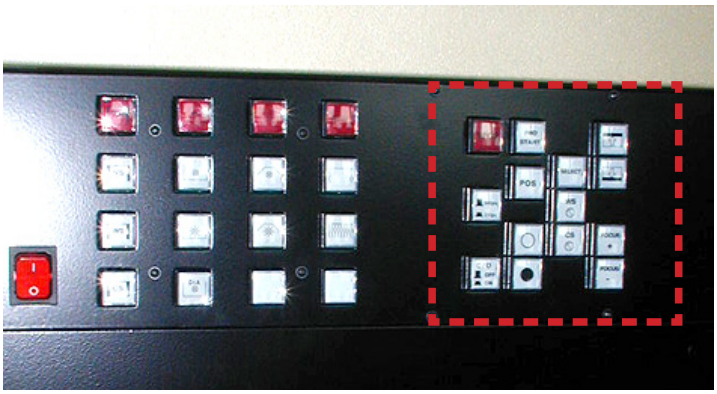
Main switch in position I:

Current transfer is switched on => the switch lights up red.

Main switch in position 0:

Current transfer is switched off => the switch is off.

4.1.2 Projector Operating Panel



STOP	Projector STOP
FWD START	Projector START
●	Dowser CLOSE
○	Dowser OPEN
▲	Framing UP
▼	Framing DOWN
FOCUS +	Focusing +
FOCUS -	Focusing -
■24fps ⎓25fps	Projection speed
C/O ■ OFF ⎓ ON	Change-over switch
CS	Format CS (option)
WS	Format WS (option)
NS	Format NS (option
POS	Position the frame
SELECT	Format SELECT (option for 2 lens turret)

4.1.3 Auditorium Remote Operating Panel (option)

Masking STOP

Masking 1

Masking 2

Masking CS


House light STOP


House light OFF


House light ON

House light HALF


Stage light STOP


Stage light OFF

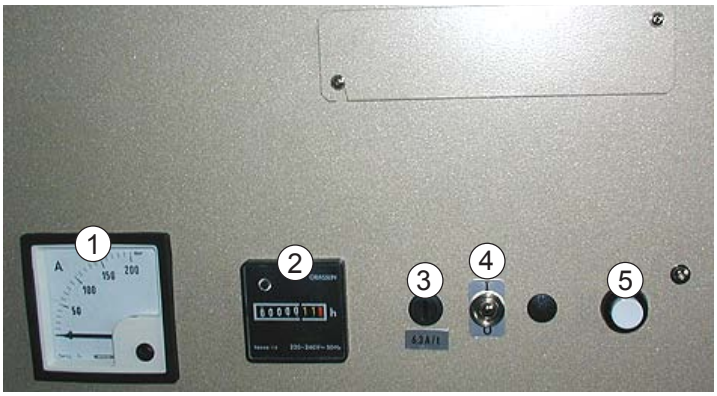

Stage light ON

Curtain STOP


Curtain OPEN


Curtain CLOSE

4.2 Projector Lamphouse



① Ammeter

② Operating hour counter

③ Fuse (6.3 A)

④ Main switch

⑤ Press button: IGNITE

4.2.1 Ammeter

The ammeter shows the set intensity of currents.

» The small lamphouse (1000 to 2000 W) is equipped with a 100 A ammeter.

» The big lamphouse (2000 to 7000 W) is equipped with a 200 A ammeter.

4.2.2 Operating Hour Counter

The operating hour counter shows the hours the xenon bulb has been in operation.

4.2.3 Fuse

If you put out the fuse the lamphouse is separated from mains.

ATTENTION

You have to screw out the fuse at all maintenance work and cleaning.

4.2.4 Main Switch

Toggle switch in position “I”:
The xenon lamp is ON. The ventilation runs after when the xenon lamp turns off.
Toggle switch in position “0”:
The xenon lamp is OFF.

Manually switch on or switch off

- Switch on the main switch (position “I”). The fan is running.
- Switch off the main switch (position “0”). The fan is off.

▶ **NOTE**

The fan runs after (approx. 5 minutes) when the projector and the xenon lamp are switched off. This thermal switch is operating with a temperature of 60° C.
If the temperature is less than 45° C the switch resets.

4.2.5 Ignition Button

The xenon lamp automatically ignites when pushing the start button on the projector operating panel.
You can manually ignite the xenon lamp by pushing the ignition button.

ATTENTION

Do not push this button for more than 0.5 seconds. The xenon bulb can be damaged if you push for a longer time. If the xenon lamp does not ignite after you have pushed the button two to three times, the ignition unit or the rectifier or the xenon bulb probably have a defect.

4.3 Rectifier

Standard rectifier

The intensity of current can be adjusted by turning the hand wheel, which moves the iron core in the coils. The adjusted intensity of currents can be read on the ammeter.

Electronic rectifier

The intensity of current can be adjusted via a potentiometer. The adjusted intensity of currents can be read on the ammeter.

Kinoton electronic rectifier (KEX 110/170)

The intensity of current can be adjusted via a potentiometer or optionally via the LDU display unit. The adjusted intensity of currents can be read on the ammeter.

▶ **NOTE**

▷ Detailed information about the rectifier can be found in the corresponding operating manual.

▷ Values for the intensity of currents, see chapter 6.4.16.

5 Operation and Troubleshooting

5.1 Switch on and Start Projector / Stop and Switch off Projector

ATTENTION

Do not stand too close on rotating film spools, because clothes, hair or other parts of your body can get winded up or trapped into the spools.

Switch on and start the projector

- Switch on the external power supply for the performance room.
- Switch on the main switch  (position “I”).

☛ The switch illuminates red.

- Thread the film (see chapter 5.2).
- Push the button  .

☛ The projector is running, the ventilation is on, the xenon lamp is on.

- If necessary push the button  on the projector’s operating panel, after the start leader has run through.

▶ **NOTE**

Immediate after the projector is switched on you must not manually turn the intermittent sprocket (e. g. for film threading) until the projector initialization is completed.

Stop and switch off the projector

- To stop the projector manually push the STOP button and close the dowser by pushing  .

☛ The dowser closes, the xenon lamp gets off, the projector stops and the ventilation is on (if the temperature is more than 60° C).

- Switch off the main switch  (position “0”).

☛ The key lamp turns off.

- Switch off the external power supply for the performance room.

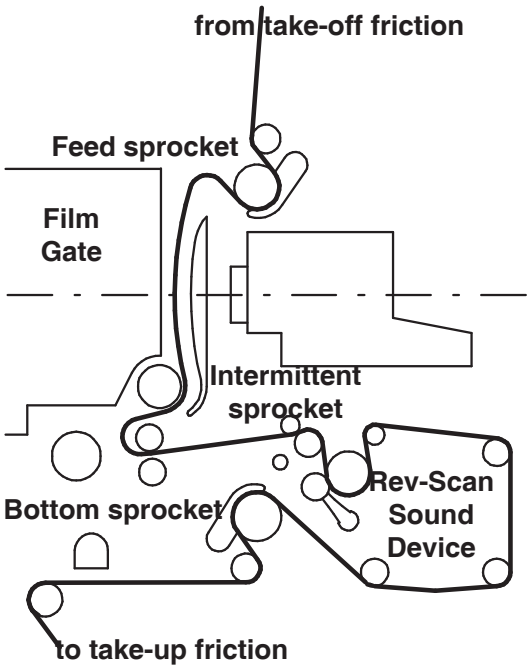
▶ **NOTE**

▷ If you have an emergency stop, push the main switch  (position “0”), to cut the power.

▷ If the film is run through the projector stops due to the film break sensor.

5.2 Threading for Projection Operation

5.2.1 General Threading



- Put the full reel on the upper reel shaft or prepare the platter system.
- Open the sprocket pad shoe.
  - Thread the film in the feed sprocket (all perforations engaged in sprocket teeth).
  - Close the pad shoe.
- Thread the film in the film gate.
  - Close the film pressure skate.
  - One whole frame must be centred vertically in front of the aperture opening. There is a small light inside the aperture to assist in centring.
  - Assure the film is centred horizontally between the ceramic discs.

A film loop of about 4 frames - 16 perforations (35 mm film) / 10 frames - 10 perforations (16 mm film) must be left both just above and just below the gate! If the loops are too big the film will touch stationary parts and be scratched. If the loops are too small the film may break, the image may jump, or the sound may warble.

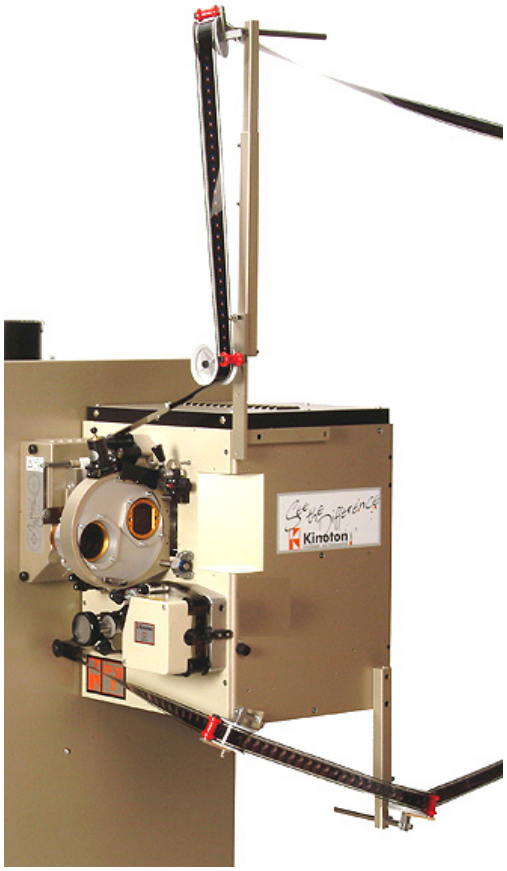
- Thread the film through the guide rollers to the sound head (35 mm film) and then to the bottom sprocket. The sound pressure roller may be lifted to ease threading
- Open the sprocket pad shoe. Thread the film in the holdback/bottom sprocket (all perforations engaged in the sprocket teeth). Close the pad shoe. Verify the loop below the gate is still OK.
- Wind-up the film several times around the take-up reel or lead the film to the “take-up” level of the platter system.

ATTENTION

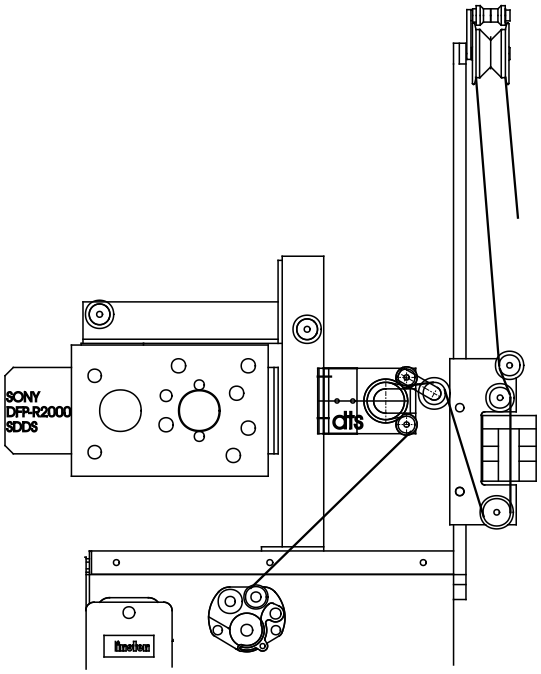
If the projector was switched off with a threaded film the film loops and the film position must be checked when the projector is switched on again.

5.2.2 Threading from a Non-Rewind / Platter System

General

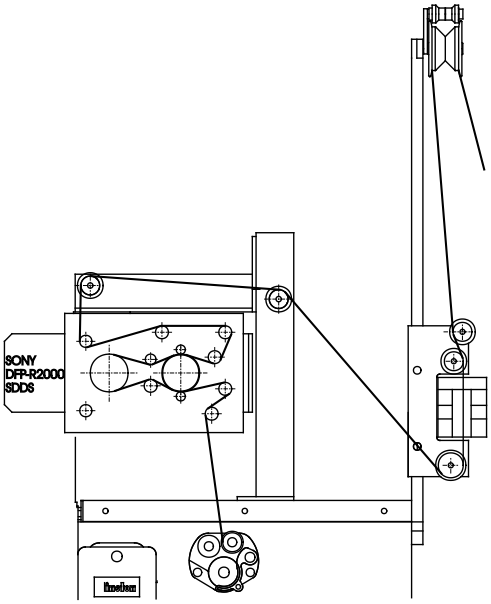


with film cleaner and DTS reader

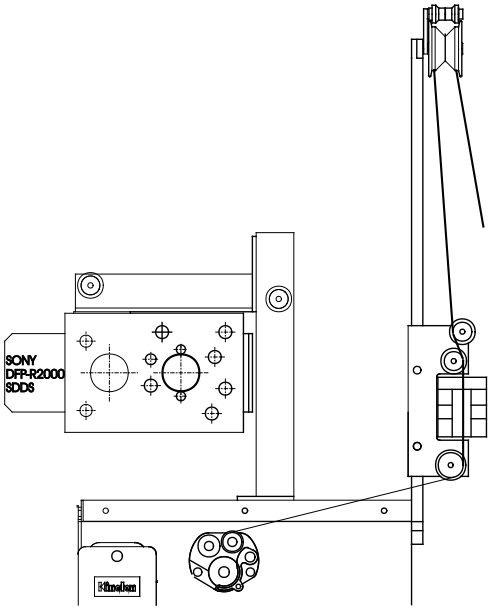


If a DTS reader is installed, but you do not use it for an operation then thread the film which comes from the non-rewind system via the upper guide roller of the DTS reader and then to the feed sprocket.

with film cleaner and SDDS reader



with film cleaner



5.3 Different Projection Speeds

▶ **NOTE**

▷ The xenon lamp will be switched on when the film is running forwards (DIP 7 is OFF).
If DIP 7 is ON the xenon lamp will ignite at the first projector start and will get off when projector is switched off.

▷ The dowser will be open when projection speed is more than zero.

▷ All switching and direction changes are to be done when projector is off.

5.3.1 General Keys

FWD START — Start forwards

24fps / 25fps — Press “in” selects 25 fps (factory-set) - press “out” selects 24 fps (factory-set)

STOP — Stop the forward or optional reverse running

REV — Start reverse (optional for projectors with reverse running unit)

24fps / varia. — Select 24 fps or VARIA speed (optional)

5.3.2 Projection / Forward Running at 24 fps or 25 fps

- To start press FWD START.
- Press “in” 24fps / 25fps to select the speed of 25 frames/seconds (factory-set), press “out” to select the speed of 24 frames/seconds (factory-set).
- Pushing STOP you can stop the forward running of projector.

5.3.3 Reverse Running (option with reverse running unit)

- To start press REV.
- Pushing STOP you can stop the reverse running of projector.

▶ **NOTE**

The reverse running speed is factory-set (in frequency inverter).

5.3.4 Projecting at VARIA Speed (option)

At VARIA the projector runs in step mode - it projects forwards and optional reverse from 10 fps to 30 fps.

Press “in“ activates the VARIA function - press “out” activates 24 fps.

Select the desired projection speed of 10 - 30 fps by turning the VARIA rotary switch.

Press to start.

Press to stop the projection running.

5.4 Change-Over Operation

- Push switch “in” on both projectors (provided the projectors are coupled with one another), to activate the change-over function.
- The dowsers of the two projectors open or close alternatively.
- The change-over projection can be started on any projector.

5.5 Operating a Pad Shoe Gently

The pad shoe has a brass bearing tube which pivots on the pad shoe shaft, and is positioned with a ring nut and a spring.

To avoid damaging the pad shoe and causing the brass tube to revolve within the pad shoe, the pad shoe must be handled gently. Follow these points:

- Do not slam the pad shoe closed.
- Only open the pad shoe as far as the stop pin.
  Do not open the pad shoe too far over the stop pin - the spring will break and the brass tube will be damaged.

5.6 Troubleshooting

5.6.1 General Hints

Even though we produce high quality, reliable equipment, there still can be problems due to incorrect operation, poor maintenance, incorrect procedures etc.

This chapter has information about some common problems and about solving those problems. It is not possible to cover all possible problems in an operating manual; we suggest each owner develops a relationship with a competent cinema service provider.

▶ **NOTE**

▷ Items marked (service) usually require experienced service technicians.

▷ Basically there are two types of errors:
- Type 1 errors: Projector won't run/stops immediately
- Type 2 errors: Errors which do not stop projector

5.6.2 Projector Troubleshooting Chart (Type 1 errors)

Error	Cause	Solution
Nothing works	- Main power is not available - Loose main power connection - 24 V DC supply failed - 24 V DC fuse on main terminal blown	- Check fuses or circuit breakers - Check main power connections - Change (service) - Change
Motor won't run, pilot lamp is on, relays move	- Frequency inverter wiring loose - Frequency inverter defective	- Check inverter connections - Change (service)
Motor runs, pilot lamp is on, sound-head LED won't lit	- Fuse blown on LED power supply board	- Check all, replace if blown

5.6.3 Projector Troubleshooting Chart (Type 2 errors)

Error	Cause	Solution
Noisy operation	- Film is threaded incorrectly - Gears are worn	- Thread correctly - Change
Rollers don't turn	- Poor cleaning - Roller worn or damaged	- Clean regularly with alcohol - Change
Film break when starting the film run	- Frictions are not adjusted correctly - Friction shafts are running dry	- Adjust - Lubricate with Cardan oil

Error	Cause	Solution
Picture moves vertically (jumps)	- skate pressure isn't adjusted correctly- - skate height isn't adjusted correctly - film print defective [verify with test film] - skate is worn - intermittent sprocket damaged	- adjust - adjust - get new print - change - change (service)
Picture moves horizontally (waves)	- ceramic discs are blocked or dirty - ceramic discs are worn [rare]	- remove and clean - change
Perforation damage in direction of travel	- skate pressure is too strong - intermittent or upper/feed sprocket teeth have worn	- adjust - change the worn sprocket(s)
Perforation damage against moving direction of travel	- take-up friction is too strong - lower/holdback sprocket teeth have worn	- adjust - change the worn sprocket
Perforation side damage	- sprocket teeth are damaged - pad shoe is damaged - film gate position is not correct [rare]	- change sprocket - change pad shoe - adjust
Scratches on film	- film loop is too large - emulsion particles / dirt on rollers - rollers, skate, and/or film runner strips are defective or worn	- thread film correctly - clean - change the worn or defective part
Picture blurring	- shutter is not adjusted correctly - skate pressure too low	- adjust (service) - increase pressure
Soft image	- dirt on lens elements	- properly clean front / rear of lens
Unable to stay in focus	- excessive heat from xenon lamp	- decrease xenon current and/or use IR heat filter - replace damaged IR heat filter - make sure light is properly distributed so there is no "hot spot
Misframed image	- incorrect threading - misframed splices	- thread properly - re-make specific bad splice

5.6.4 Analog Sound

Error	Cause	Solution
No sound / some channels missing	- sound processor failure - amplifier failure - speaker failure	- check plugs and power; call service - check if sound track is threaded on the correct side - check / replace exciter lamp (standard sound) or red LEDs (rev. scan sound) - check all equipment for blown fuses / tripped circuit breakers
Sound out of sync with picture	- lower loop wrong size - wrong threading path	- thread correctly - thread correctly
Loss of high frequencies	- dirty sound optics - sound optics focused poorly	- clean with lens cleaner and Q-tip - adjust sound optics' focus (service)
Garbled sound	- scanning drum jammed - sound pressure roller loose	- remove blockage; change or oil bearings - adjust tension (service)
Hissing sounds	- scratches on sound track - dirt on sound track - defective sound electronics	- replace print - clean - troubleshoot and replace (service)

5.6.5 Digital Sound

Error	Cause	Solution
No sound	- check the following [also see the "no sound / some channels missing" section of "Analog Sound", above.]	- film is encoded for digital playback - digital sound processor is on - processor is switched to the correct mode - disk is loaded correctly and the right disk is in place [DTS only] - film is threaded correctly
Sound out of sync with picture	- loops wrong size - wrong threading path	- thread correctly - thread correctly
Poor digital sound	- improper tension - dirt on lens - dirt on digital sound track - scratches on digital track	- re-thread - remove dust using compressed air - clean digital soundtrack - replace print

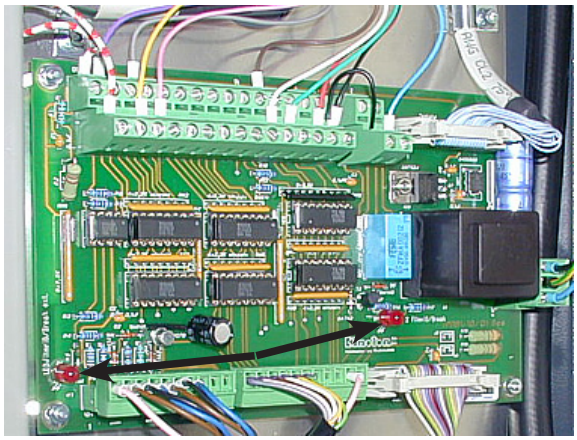
▶ **NOTE**

If there are any serious other problems please call local service.

5.7 Error Indication with LEDs

5.7.1 Interface Board

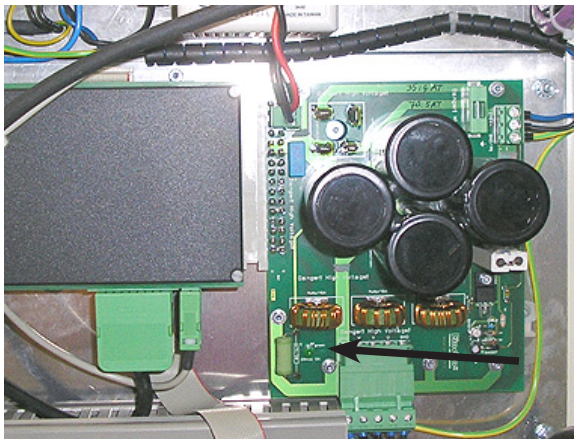
Two red break LEDs (arrows) are mounted on the interface board.



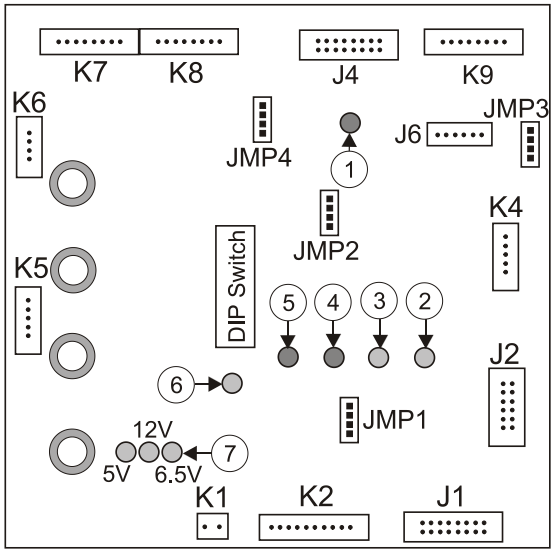
- The left LED (in the near of the projector door) labelled with ***Filmriss/break ext***. illuminates only if there is an external film break (e. g. on the non-rewind system).
- The right LED labelled with ∑ ***Filmriss/ break*** illuminates with every film break.
- If both LEDs illuminate an external break was happened. If LED ∑ ***break*** illuminates a break on the projector (internal) was happened.

5.7.2 FPS 300 Power Supply Unit

The green LED (arrow) on the power supply unit of the intermittent sprocket motor illuminates if there is an intermediate circuit voltage available.



5.7.3 Main Board



① Red: intermittent sprocket drive is faulty

② Green: shutter motor runs synchronously

③ Green: shutter frequency is stored

④ Red: shutter rotates too slow

⑤ Red: shutter overload voltage is on

⑥ Green: shutter is open

⑦ Green: voltage values are ok (5 V, 12 V, 6.5 V)

6 Cleaning / Maintenance / Repair

6.1 General Hints

ATTENTION

△ Any work on the electric supply wiring must be carried out by electricians.

△ Make sure that nobody starts the projector while you are working on it.
For all maintenance, cleaning and repair you must disconnect the projector from its power supply (switch off the main switch).

△ All adjustments must be carried out by experts.

Because of using many maintenance-free parts, the consumption of material and the expenditure of time for maintenance work and repair are reduced to a minimum.

The necessary maintenance and cleaning work may be performed by the projector's operators. This work has to be carried out regularly and carefully. See the following lists regarding the schedule for this work.

6.2 Cleaning

▶ **NOTE**

The film print should not be used oily or dirty with antiblocking agents, but always clean and dry.

After each show

Component	What is to do?
Film path / aperture	Clean with a soft toothbrush or cloth / Blow out with air pressure.
Sprockets / pad shoe	

Daily

Component	What is to do?
Film path / aperture	Clean with a soft toothbrush or cloth / Blow out with air pressure.
Sprockets / pad shoe	
Lens	Clean with a lens cleaning brush.

ATTENTION

△ Using air pressure can make problems, because the dirt will not be absorbed but pressed into bushings and optics.

△ Never use sharp objects to remove particles from film path.

Every 2 weeks

Component	What is to do?
Ceramics roller	Remove the ceramics rollers and then remove the dirt in the holes by using air pressure. Clean the ceramics roller with a alcohol moisturized cloth.

Every 3 months

Component	What is to do?
Film break sensor	Clean the film break sensor with a soft cloth.
Main drive motor / fan	Blow out the dust with pressurized air.
Guide rollers	Clean the guide rollers and roller shafts with alcohol.
Spool shafts	Lubricate with Esso universal oil.

Every 6 months

Component	What is to do?
Shutter / shutter housing	Clean the shutter housing with pressurized air. Clean shutter edges with a soft toothbrush.
Lens turret (if existing)	Clean the coding plates and the sensors on the sensor board with a Q-tip moisturized with Isopropyl or Isopropanol.

ATTENTION

Do not blow with pressurized air into the rotor - particles can be blown into the rotor and block the rotation.

6.3 Maintenance

Every 3 months

Component	What is to do?
Lens holder	Lubricate the lens holder guidance with Cardan oil, type 8657
Aperture changer (if installed)	Clean the part of the shaft above the film path with a cloth, and the threaded part of the shaft (inside the back cover) with a brush. After cleaning lubricate the threaded part of the shaft with ball bearing grease or Esso universal oil. Do not lubricate the brass tube/non threaded parts of shaft!

Every 6 months

Component	What is to do?
Reverse-scan sound device	Check O-rings on sound pressure roller. Check all rollers, whether they run easily.

Annually

Component	What is to do?
Sound reproducer	Lubricate the pressure roller ball bearings with a drop of Cardan oil, type 8657. **Do not use any other lubricant!** Lubricate the sound drum shaft with 1 drop of Esso universal oil.

▶ **NOTE**

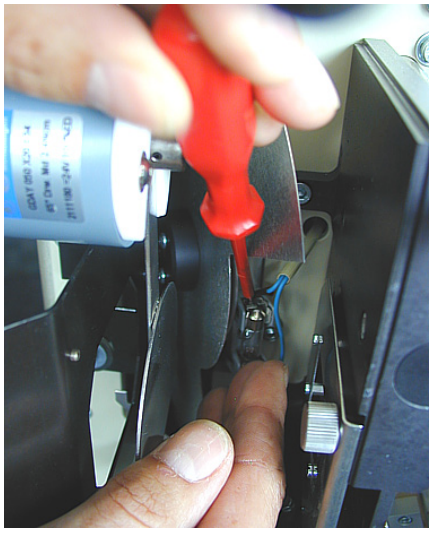
▷ Cardan oil is very pasty therefore the ball bearings will be retarded for a proper film run. By getting move the guide roller with one finger, the roller has to stop at last after a half of turn. Otherwise you have to clean the bearing and then fill it with Cardan oil.

▷ You must not use any oil or grease!

Water cooling (if existing)	Empty and clean and refill coolant. Check whether pump and refrigeration system are sealed and working properly.

6.4 Repair and Adjustments

6.4.1 Changing the Pilot Lamp



ATTENTION

Before opening the shutter housing, wait until the shutter stands still!

- Remove the shutter housing.
- Put screw driver behind the lamp socket (arrow) and lift the lamp out of the socket.
- Push the new pilot lamp into the socket and close shutter housing.

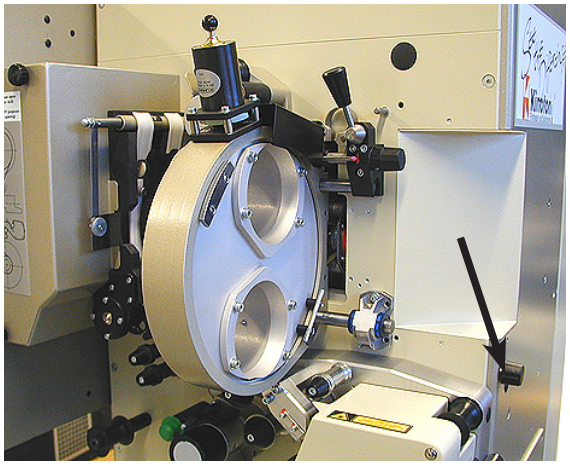
6.4.2 Adjusting the Pressure of the Skate

The correct adjustment of the film pressure skate is mandatory in order to run the film easefully and steady-going and with minor wear and tear of projector and film copy.

- Reduce the skate pressure by turning the adjusting knob (arrow) such that the picture begins to shake vertically on the screen.

☛ The projector running noise becomes louder and more unsteady.

- Increase the skate pressure until the running noise becomes quietly and steadily and the picture steadiness is correctly.



▶ **NOTE**

▷ Only tighten the film pressure skate as much as is absolutely necessary!

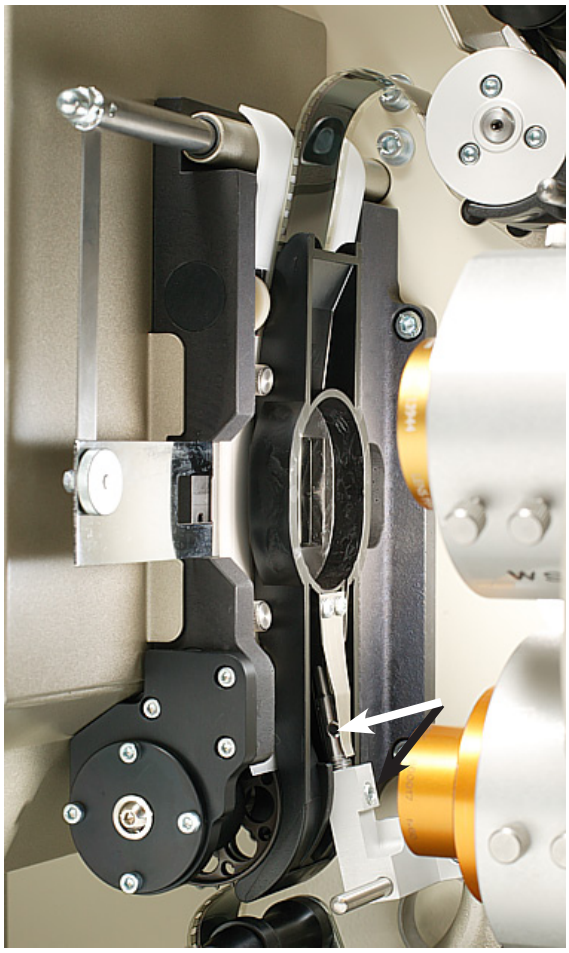
▷ Pressure too low:
- The picture shakes on the projecting screen.
- Loud noise

▷ Pressure too high:
- The sprocket teeth, the film perforations, the film pressure skate and the runner strips will wear excessively.
- Film emulsion will be left in the gate.

▷ The necessary pressure of the skate depends on the used film material.
It is recommended to check the skate pressure again, after splices have run through the film gate and also after the film material has been changed.

6.4.3 Adjusting the Film Pressure Skate Height

The film pressure skate has to be adjusted so that it rides perfectly on the film gate and the intermittent sprocket.

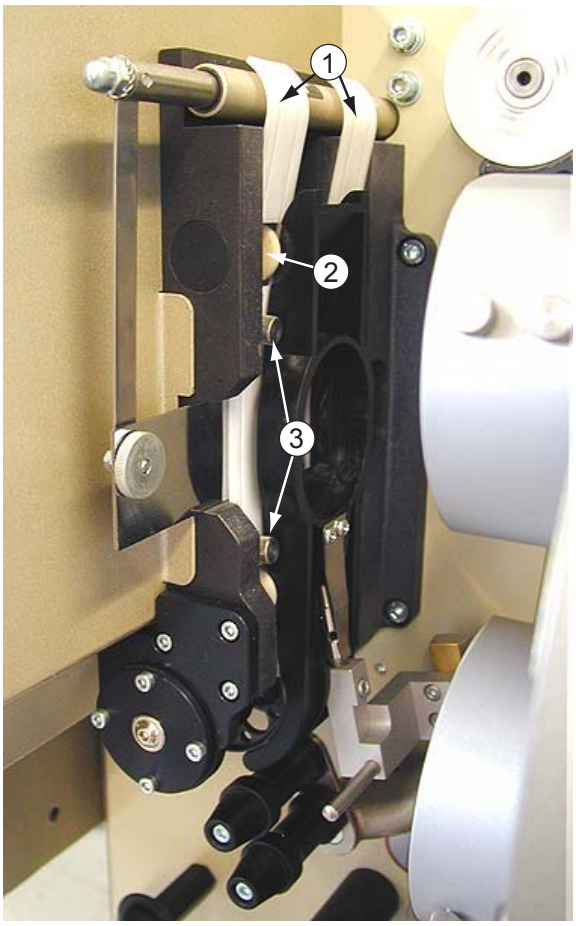


- Loosen the setscrew (black arrow).
- Insert 2 superimposed film layers into the film gate.
- Screw the ball pin (white arrow) out or in to the desired length - the skate should just not be moved vertically. Use an Allen wrench to rotate it.

☛ Without any film layers in the film gate the skate must have clear tolerance.

- When the adjustment is adjusted correctly fasten the setscrew again.

6.4.4 Changing the 35 mm Film Runner Strips



① Film runner strips (2)

② Ceramic rollers (2 per strip)

③ Knurled fastening screws (4)

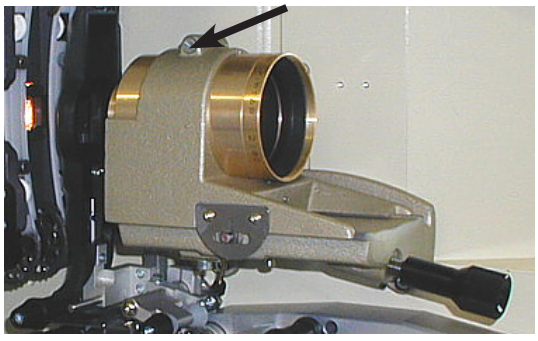
- Loosen the knurled fastening screws and remove the old runner strips and insert the new runner strips.

☛ They must lay in parallel to the vertical film gate edges.
The small spring-suspended ceramic rollers must have a free clearance.

☛ The seat is correct, if the conic ending running strips are lying lightly on the sprocket without touching the teeth, so that a perfect film run even with splices is assured in both directions.

- Tighten the knurled screws.

6.4.5 Adjusting the Lens Holder



- For setting up lenses, set scale in the mid-position.
- Loosen the clamping screw (arrow) and push the lens into the holder until picture is sharp (basic adjustment).
- Tighten the clamping screw again.
- Repeat the adjustment for each lens without turning the focus knob.
- To adjust the picture focus finally turn the knob slightly as required.

6.4.6 Changing a Constant Speed Sprocket / Pad Shoe

- Loosen the locking nut (black arrow) and the adjusting nut (white arrow) of the pad shoe with the special tool – the spring will relax.
- Pull the pad shoe from its shaft.
- Loosen the film stripper setscrews (two black arrows) and remove the film stripper.
- Turn the sprocket locking screw (on sprocket surface) anticlockwise five to six turns to loosen the sprocket.
- Pull the sprocket from its shaft.

▶ **NOTE**

If the teeth of sprocket are worn on one side only, you can turn it and use the other side (not with combined sprockets). Otherwise you must replace the sprocket.

- Install the sprocket onto the shaft with a slight counter-pressure on the belt wheel in the projector.
- Tighten the locking screw on the sprocket again.

▶ **NOTE**

The sprocket end play should be between .0004” (0.01 mm) and .001” (0.03 mm).

- Put on the film stripper again and fasten the 2 stripper setscrews in a way that it does not touch the sprocket surface.
- Grease the pad shoe shaft with Cardan oil and then put the pad shoe onto the shaft.
- Place the torsion spring in the hole of spring cage and place the whole assembly in pad shoe again.

▶ **NOTE**

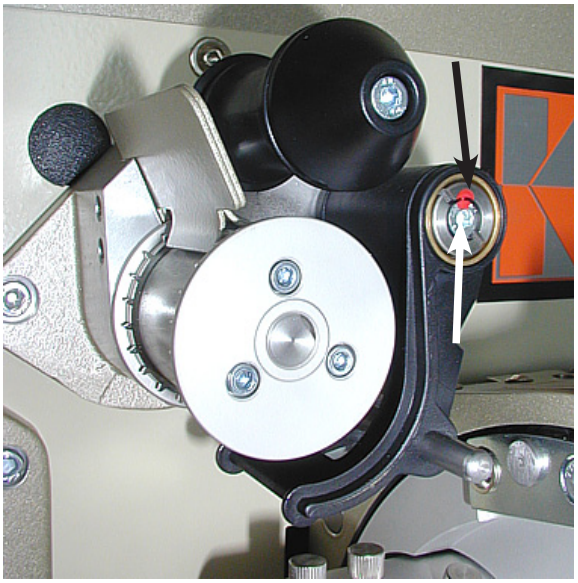
Be sure that spring end is placed exactly in hole of pad shoe.

6.4.7 Adjusting the Tension of the Pad Shoe Spring

- Loosen the locking screw (black arrow) with an Allen key.
- Adjust the tension of the spring by turning the adjusting ring (white arrow) clockwise with a special tool.

☛ The pad shoe pressure should be (measured on pad shoe with a spring scale):
- 450 g ± 50 g at open condition and
- 150 g to 250 g at closed condition.

- After adjustment lock the spring by tightening the locking screw (black arrow) again.



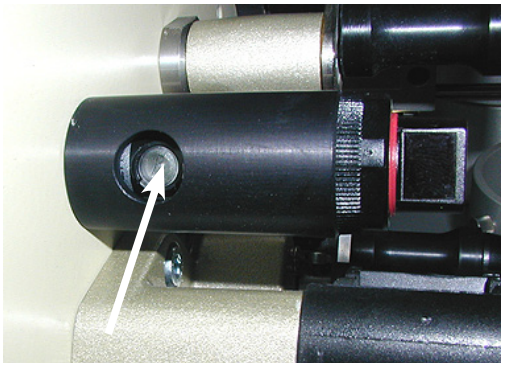
6.4.8 Adjusting the Distance between Pad Shoe and Sprocket

- Turn the adjusting screw (arrow) until a gap of 2 film layers is generated between the sprocket and the pad shoe.
- After adjustment paint-lock the adjusting screw.

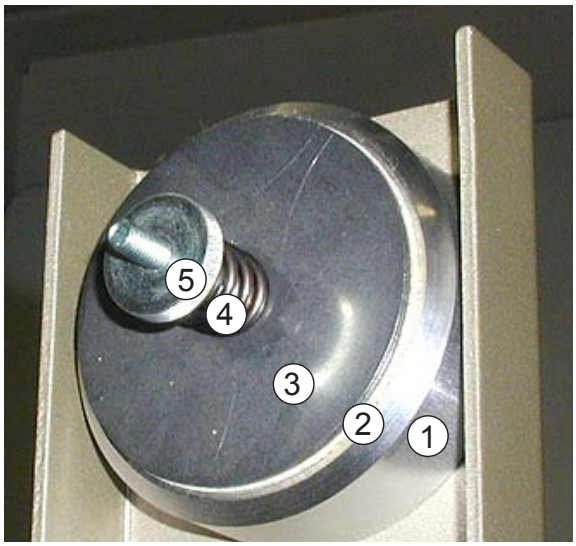
6.4.9 Adjusting the IR Reflex Film Break Sensor

Position the sensor (arrow) in a way that it “looks” vertically towards the film surface. The sensor’s view must be perpendicular to the film.

- To adjust the sensitivity of the sensor thread a film and turn the plastic screw (arrow) with a screw driver until the red LED (adjusting aid) blinks.
- Then turn the screw until the LED surely lights steadily.



6.4.10 Adjusting the Mechanical Friction



① Friction body
② Felt disk
③ Friction disk
④ Spring
⑤ Knurled nut

Via the knurled nut the spring tension can be adjusted and therefore the pressure against the friction disk to the felt disk. Adjusting the frictions is necessary if the felt disk was replaced.

Adjusting the take-off friction:

- Put a full film spool onto the take-off friction shaft.
  Thread the film and run the projector.
- Stop the projector - the film should not build a loop, otherwise the friction is adjusted with too small pressure.
- Turn the knurled nut clockwise to increase the pressure onto the felt disk.

Adjusting the take-up friction:

- The take-up film spool has to be nearly full, then stop the projector - the film should not build a loop.
- If necessary adjust:
  - Right turn of the knurled nut => spring increases the pressure
  - Left turn of the knurled nut => spring decreases the pressure

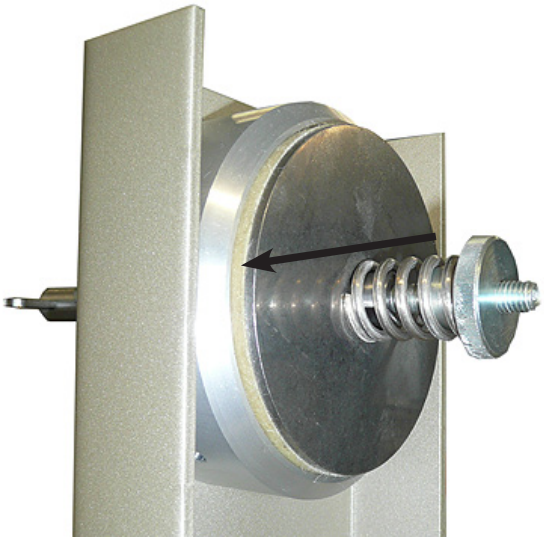
▶ **NOTE**

▷ Depending on the film reel length the film tension has to be adapted.

▷ The film tension is inversely proportional to the reel diameter:
The film tension is less, when the reel diameter is large (beginning of take-off friction).

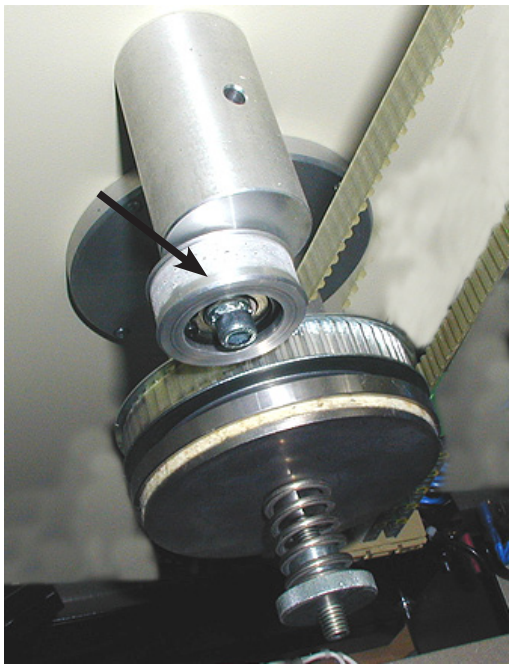
6.4.11 Changing and Lubricating the Felt Disk of the Mechanical Friction

- Remove the knurled nut, the spring, the friction plate and the felt disk on the friction shaft (arrow).
- Once in a year the felt disk should be put in a Cardan oil bath. If the felt disk is worn (surface is hardened) it has to be changed and oiled.
- Mount the friction again.
- Thread a film and adjust the friction (see chapter before).



6.4.12 Adjusting the Tension of the Friction Toothed Belt

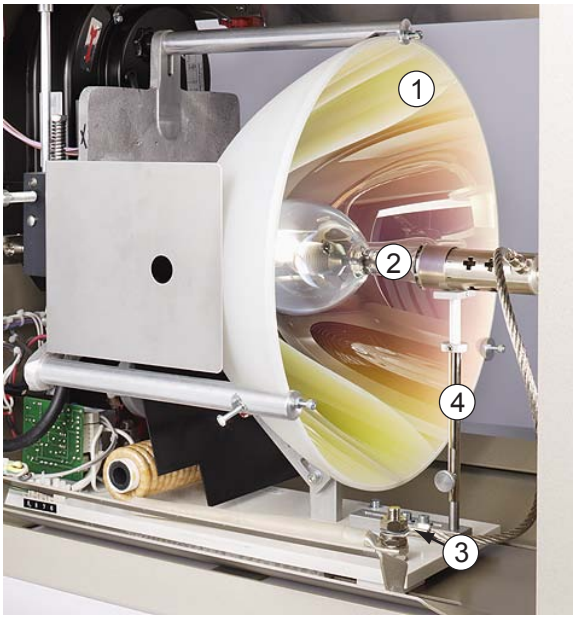
- To tension the toothed belt loosen the Allen screw of the eccentric unit (arrow) from the projector front side.
- Turn the eccentric unit manually until the toothed belt is tension correctly.
- Fasten Allen screw on projector front side again.



6.4.13 Changing the Xenon Bulb

DANGER

- ▲ Xenon bulbs should only be changed by trained personnel.
- ▲ Xenon bulbs are high-pressure glow-discharge lamps in which a high interior pressure exists even if not in operation.
- ▲ Inserting the xenon bulb wear safety cloves, face protection and protective suit. Do not insert the xenon bulb with any violence.
- ▲ Do not insert the xenon bulb by touching it at the anode base.
- ▲ Install the xenon bulb only in its protective coat.



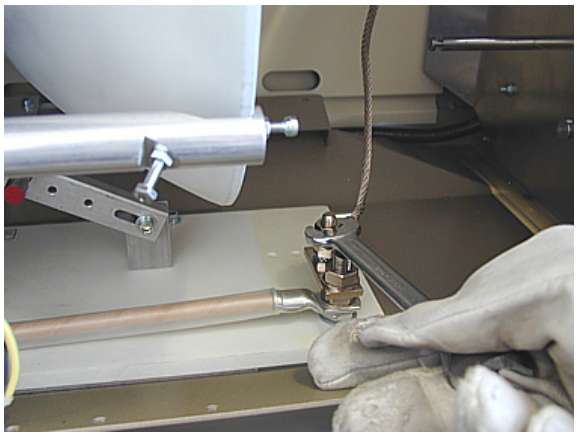
① Reflector

② Xenon bulb

③ Anode (+) cable connection

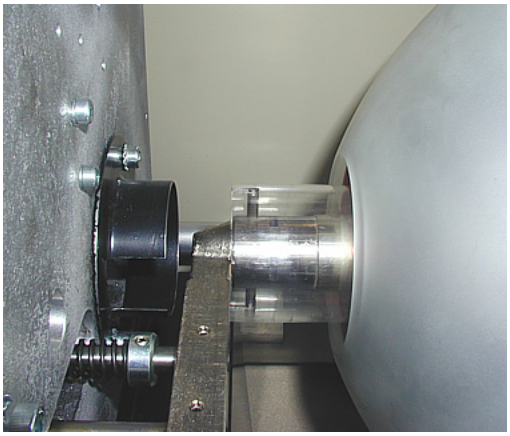
④ Bulb support
(only in big lamphouses)

- Remove the lamphouse door, by loosening the 2 Allen screws.
- Remove the anode cable from the lamphouse connecting bolt.

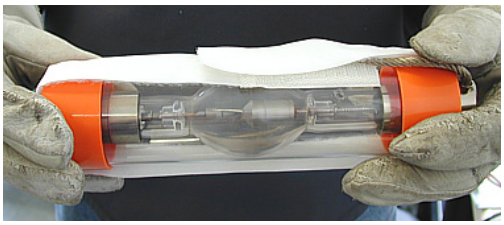


Up to 2000 W xenon bulbs:

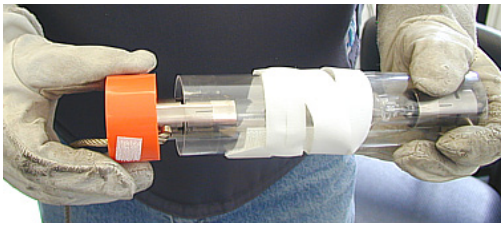
- Put the protection coat over the bulb - thread the anode cable through the coat opening and shove the protective coat to the bulb's socket such the coat slits slide over the socket's pin.
- Unscrew the bulb by turning the protective coat.



- Pack the used xenon bulb as shown in figures.

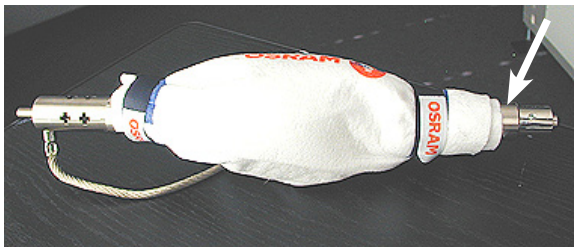


- Open the protective coat cap of the new xenon bulb and screw the bulb in its protective coat into the lamphouse socket.
- Remove the protective coat and connect the anode cable to the lamphouse socket.
- Close the lamphouse door.



Up to 7000 W xenon bulbs:

- Loosen the bulb support and put it down.
- Put the protective bonded fabric or a strong cloth around the unpacked bulb.
- Loosen the bulb fixing screw with an Allen key through the lamphouse opening.
- Remove the bulb and then the adapter on the bulb socket by loosening the fixing screw.
- Pack the used xenon bulb.
- Fasten adapter onto the new xenon bulb (arrow) - bulb is packed in protective bonded fabric.



- Thread the xenon bulb through the central mirror hole and fasten it by tightening the Allen screw from the lamphouse outside.
  Before inserting the 7,000 W bulb, turn the axial adjustment so far as possible in forward direction to get more space.
- Remove the protective coat and connect the anode cable to the lamphouse socket.

ATTENTION

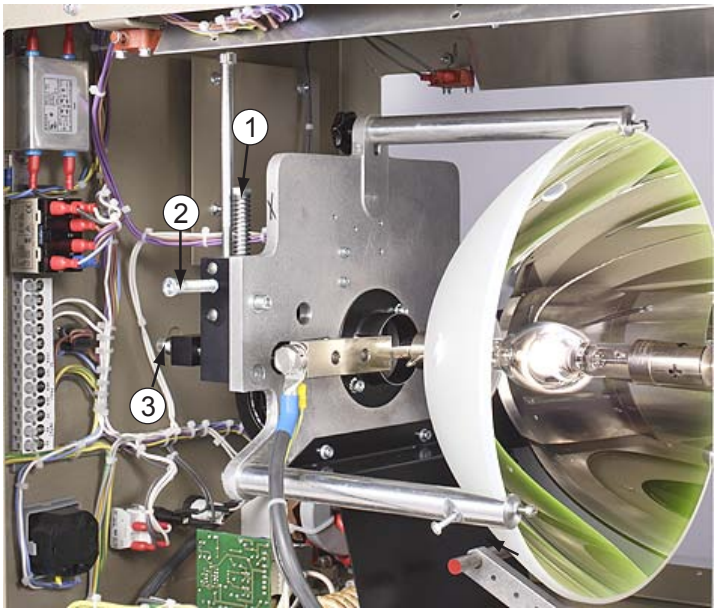
△ Position the anode cable away from any metal components as far as possible especially when inserting xenon bulbs with 40 cm anode cable.

△ Do not mechanically stress the anode cable to avoid bulb explosion.

☛ The bulb support stays down for adjusting the screen illumination.

- Close the lamphouse door.

6.4.14 Adjusting the Illumination of Screen



① Vertical adjustment

② Horizontal adjustment

③ Axial adjustment

The xenon bulb's position can be adjusted relatively to the mirror in three axes (horizontal, vertical and axial).

- Insert the CS lens.
- Start the projector and select the CS format. Immediately check the intensity of currents, if necessary adjust, see next chapter.
- Using an Allen wrench on ③, the xenon lamp can be adjusted as much along the optical axis until only a reduced round illuminated spot can be seen on the screen (focal length adjustment).
- By turning the adjusting screws right – left (horizontally) ② and up – down (vertically) ① you bring this light spot precisely into the middle of the screen.
- Turning the adjusting screw ③ (axial) you draw up the spot until the screen illumination is even. If necessary adjust the horizontal and vertical axis again.
- Switch off the projector and within the lamphouse.
- Open the lamphouse after a waiting period of at least 10 minutes.
- Adjust the bulb support to the anode base.

☛ The bulb support should barely touch the anode base - leave 1/10 mm space for the expansion of the hot xenon bulb.

▶ **NOTE**

If there is no visible gap between the anode and the bulb support, but it is still possible to slide a piece of paper between them, the bulb support is adjusted properly.

6.4.15 Adjusting the Intensity of Currents

▶ **NOTE**

▷ Read the data sheet which is delivered with xenon bulb. The bulb manufacturer's own data should be used.

▷ Read also rectifier's operating manual.

The intensity of currents associated to the installed xenon bulb can be adjusted on the rectifier. The control can be operated by a potentiometer, a hand wheel, bridges, etc.

Lamp Capacity [W]	Typical Current [A]	Max. Current [A]
1000	50	55
1600	65	70
2000	70	85
2500	90	100
3000	100	110
4000	135	150
5000	140	150
7000	160	165

6.4.16 Checking the Light Arc Stabilizing Magnet

A magnet stabilizes the arc between cathode and anode. An even well adjusted light arc provides a good optical efficiency and increase the life of the xenon lamp.

DANGER

▲ An adjustment can only be carried out by service personnel.

▲ An adjustment can only be carried out when xenon lamp is on. Therefore this adjustment requires special protective equipment.

▲ Adjustment must be carried out with a special welders' mask and suitable protective equipment.

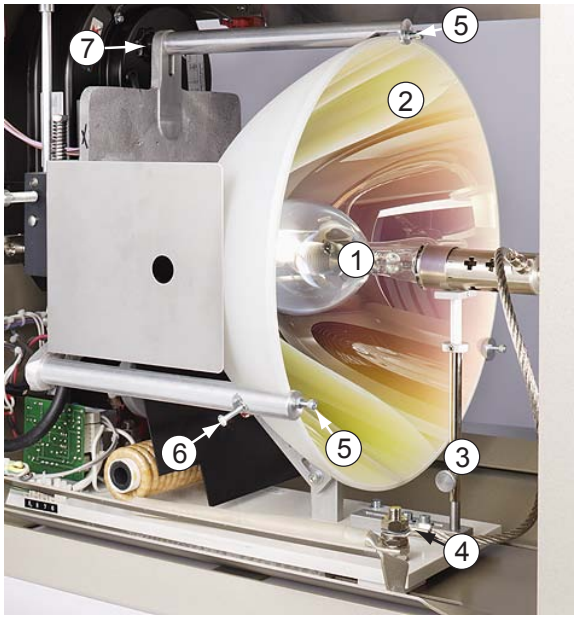
6.4.17 Changing the Reflector

▶ **NOTE**

▷ The reflector should only be changed by the projectionist in case of need.
At the next opportunity the reflector should be adjusted finely by service personnel who has the necessary alignment tool.

▷ At normal case the reflector should be changed and adjusted by service personnel.

▷ The following chapter describes how the reflector can be changed in case of need.



① Xenon bulb
② Reflector
③ Bulb support (only big lamphouses)
④ Anode connecting bolt
⑤ Adjusting/fixing screws
⑥ Counterscrew
⑦ Handle star

DANGER

Observe the safety instructions, when opening the lamphouse.
- Switch off the projector.
- Wear protective clothes.
- Open the lamphouse only after waiting period of at least 10 minutes.

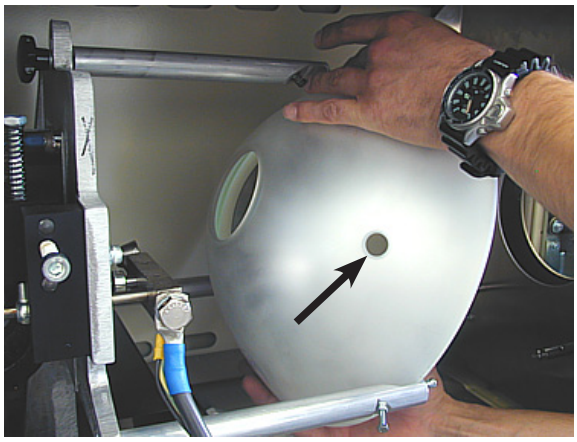
Removing the Reflector

- Remove the lamphouse door.
- Remove the xenon bulb.
- Loosen the upper holder rod by turning the handle star ⑦.
- Carefully take out the reflector by tilting it forwards while the upper holder bar is moved upwards.
- At this opportunity clean lamphouse by blowing compressed air in the lamphouse and finally remove the dust with a vacuum cleaner.

Mounting the Reflector

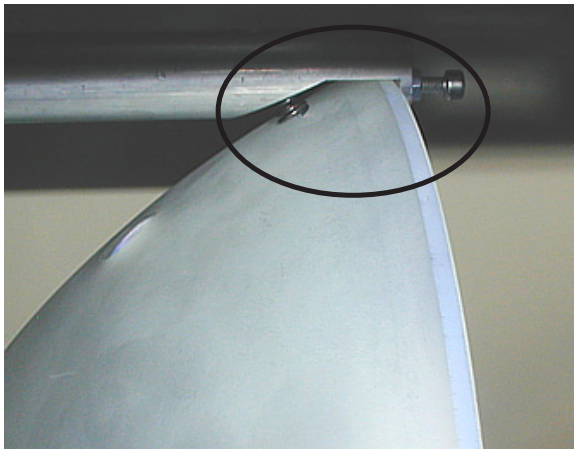
- Put down the reflector onto the lower holders.
- Move the upper holder bar over the reflector and carefully put it down on the reflector edge.

☛ Installing the reflector look for the inspection window in the reflector.
It must face to the operator side.

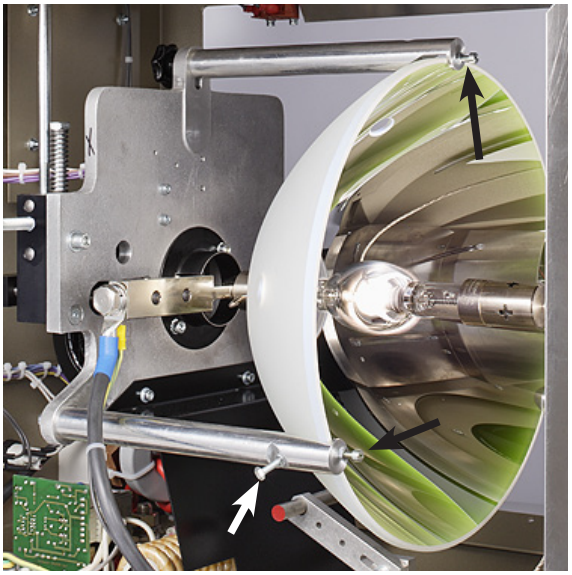


☛ The reflector edge must be positioned exactly in the three holders.

☛ In the upper holder the reflector should have about 1 mm distance to the holder and the spring should lay evenly on the reflector surface.



Coarse Adjustment



- The reflector can be adjusted by turning the adjusting screws on the reflector holder bars.
- Adjust the space between the reflector set screws and the reflector surface to 0.2 mm. The set screws (black arrow) prevent the reflector from sliding back into the reflector holder rods.
  Pushing the reflector towards the holder rods the set screws should stop it at 0.5 to 1 mm movement.

ATTENTION

The set screws must not touch the reflector surface if properly adjusted.
Due to mechanical strain the reflector may break if not properly adjusted.

- Tighten the handle star on the upper mirror holder.

ATTENTION

Be careful that the main reflector will not be clamped too toughly - during the operation the reflector expands and therefore could break.

▶ **NOTE**

The fine adjustment has to be carried out by service from Kinoton.

- Insert the xenon bulb.
- Close the lamphouse.
- Adjust the screen of illumination

6.4.18 Changing the Heat Filter

ATTENTION

The heat filter is a reflection filter, therefore you have to watch out for the reflection side of filter to be directed to xenon lamp (marked with a black dot).

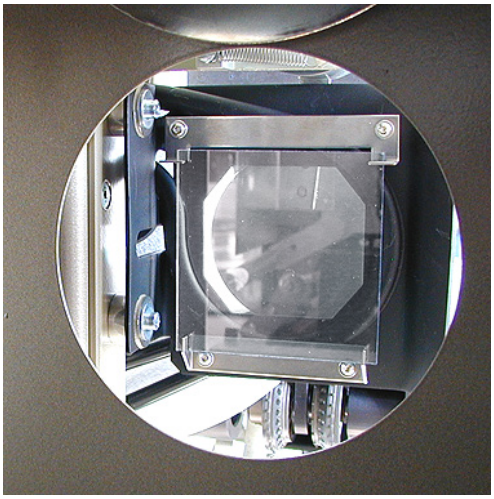
- Remove the old filter.

In Lamphouse

- Open the lamphouse.
- Put the heat filter onto the holders.
- Close the lamphouse.

In Film Gate

- Remove the shutter housing.
- Put the heat filter into the slits of the holders.
- Close the shutter housing.



7 Parts and Wearing Parts

7.1 Film Gate Parts

Film Gate	Fig.	Order No.
Film runner strip, white Film runner strip, Novotex brown	1A	1000 463 17005 1000 463 17013
Knurled screw for film runner strip fastening	1B	5322 505 10336
Ceramics roller	1C	5322 532 50362
Film pressure skate black	1D	1000 463 17020

7.2 Feed/Bottom Sprocket Parts

Sprocket Parts	Fig.	Order No.
Film stripper for feed and bottom sprocket	2A	1000 404 57008
Pad shoe	2B	5322 525 30003
Nut for pad shoe	2C	5322 462 50027
Spring for pad shoe	2D	5322 492 40001
Hand wheel bottom sprocket		1000 413 47002

7.3 Guide Roller Parts

Guide Rollers	Fig.	Order No.
Large guide roller Ø 34 mm Cap	3A 3B	1000 525 37042 5322 462 70374
Guide roller Ø 20 mm Cap	3C 3D	1000 525 67054 5322 462 70373
Guide roller with ball bearing and stay roller	3E	1000 525 37041
Guide roller with ball bearing	3F	1000 525 67028
Guide roller support with 2 shafts		1000 404 57065

7.4 Other Parts

Others	Fig.	Order No.
Knurled screw for shutter housing	4A	5322 505 10192
Focusing knob	4B	1000 413 37001
Skate pressure adjusting knob	4C	1000 413 37001
Knurled screw for lens fastening (M 4 x 8)	4D	1000 502 17004
Film cleaner		0040 060 0048X

Figure 1

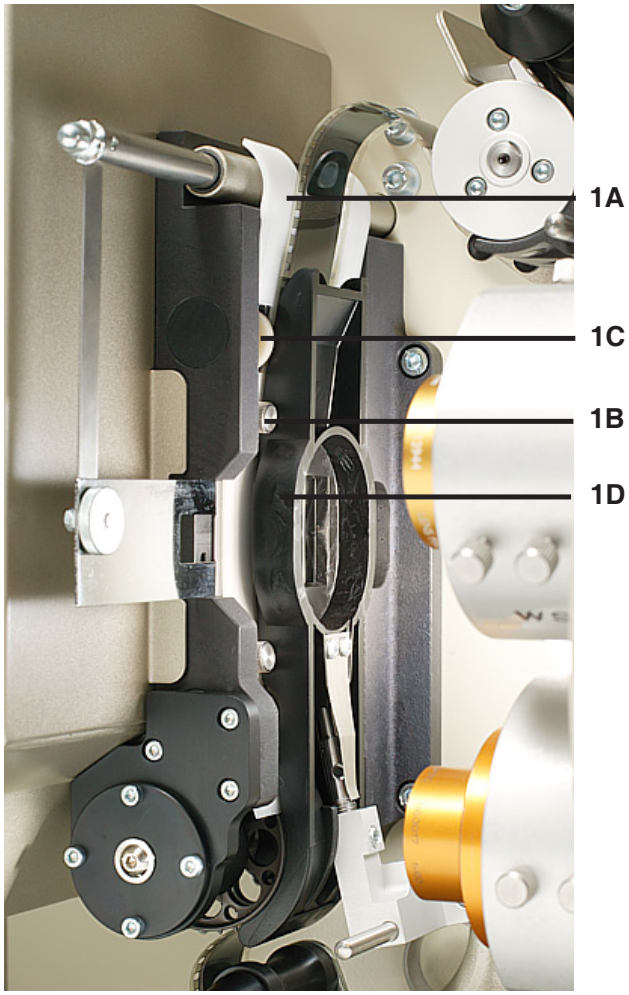


Figure 2

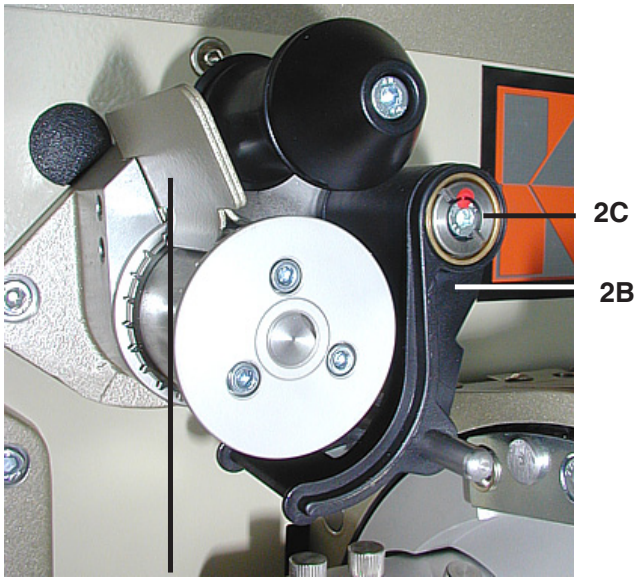


Fig. 2B

Fig. 2C

Fig. 2D

Figure 3

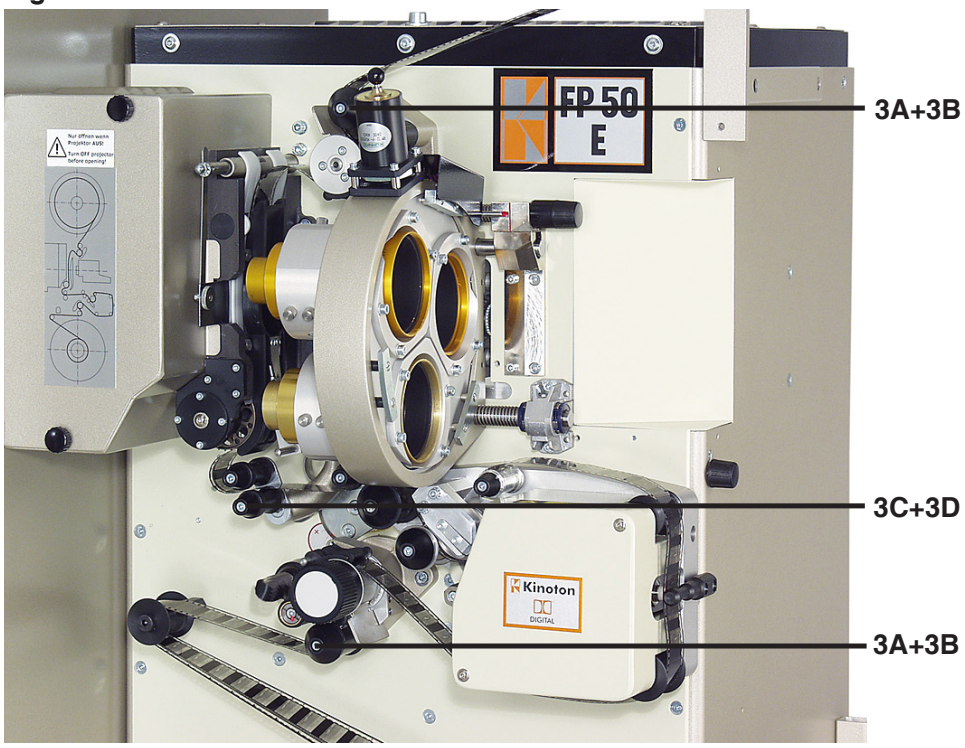


Fig. 3A

Fig. 3B

Fig. 3C

Fig. 3D

Fig. 3E

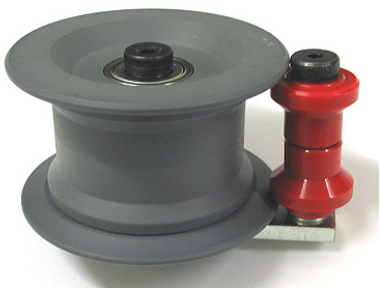
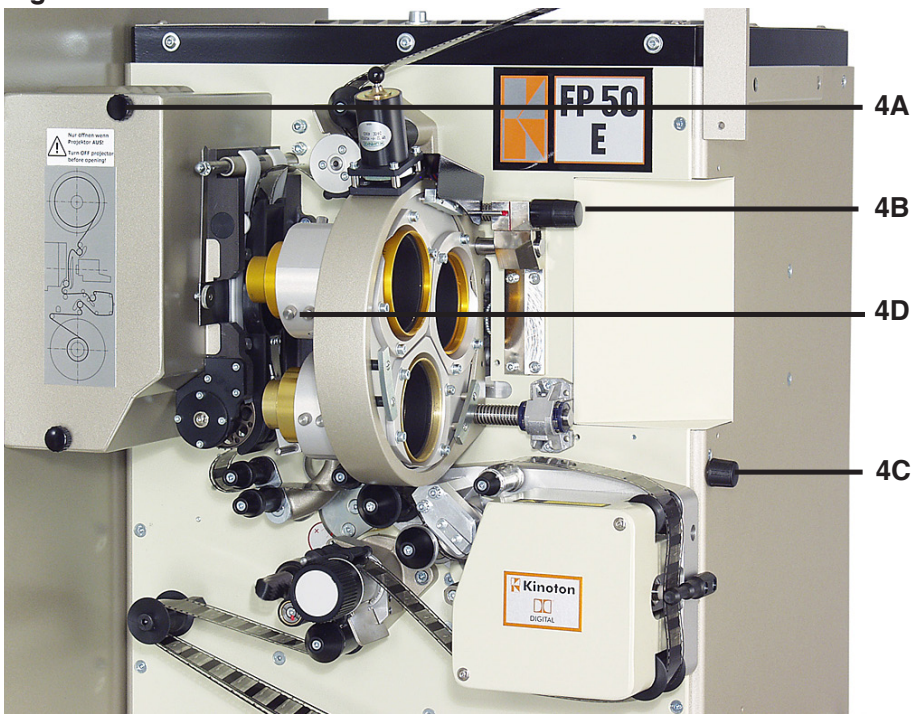


Fig. 3F

Figure 4



7.5 Parts for Drives and Motors

Part	Fig.	Code number
Felt disk for all Kinoton frictions	5A	1000 532 57007
Spring	5B	5322 492 50064
Knurled nut M8	5C	1000 505 17006

Figure 5

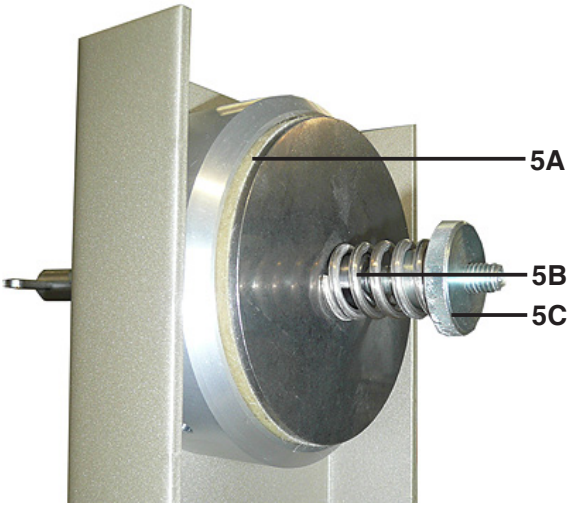
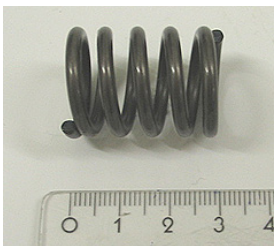


Fig. 5A

Fig. 5B



7.6 Film Spools

Film Spools	Order No.
Ø 9 mm, 600 m film	0040 060 00050
Ø 12,7 mm, 1800 m film	0040 060 00765
Ø 12,7 mm, 2000 m film	0040 060 00770

7.7 Friction Shafts and Interchangeable Flanges with Shafts

Friction Shafts	Order No.
Ø 12.7 mm (USA)	1000 535 77055
Ø 12.7 mm	1000 535 77054
Ø 9 mm	1000 535 77053

7.8 Electronic and Control Parts

Electronics and Control	Order No.
Pilot lamp, 24 V / 3 W	0040 120 00059
Key lamp	1000 134 87005
Fuse 6.3 AT	4822 253 30031

7.9 35 mm Apertures for Aperture Changer

Part	Code Number
Triple aperture shaped	1000 451 17012
Triple aperture for filing	1000 451 17016
Hole aperture to adjust the frame center	1000 451 17017
Triple aperture dimension smaller than specified	1000 451 17020
Hole aperture for filing	1000 451 17022

7.10 Single Apertures

Part	Code Number
Single aperture complete CS 2.35:1	5322 451 10009
Single aperture complete NS 1.37:1	5322 451 10011
Single aperture complete 1.85:1	5322 451 10012
Single hole aperture complete	5322 451 10013
Single aperture for silent movies	1000 451 17014
Single aperture complete Super 35 mm	1000 451 17015
Single aperture finished size 1:1.37	1000 451 17023
Single aperture finished size 1:1.66	1000 451 17024
Single aperture finished size 1:1.85	1000 451 17030
Single aperture finished size 1:2.39	1000 451 17034
Single aperture S35/1:2.39	1000 451 17029
Single aperture CS+1:1.66	1000 451 17031
Single aperture S35/1.1.85	1000 451 17032
Single aperture S35/CS	1000 451 17033

7.11 Adapter Rings for 35 mm Lenses

Name	Order Number
Adapter ring 1: ISCO Cinemascope Ultra-Star 55 / 60	0070 410 00003
Adapter ring 2: Schneider Super-Cinelux 50 / 52,5 / 55 / 57.5 / 60ISCO Ultra-Star HD 42 / 45 / 48 / 50 / 55 / 60 / 65 / 70 / 75 / 80 / 85 / 90 / 95ISCO Ultra-MC 35 / 45 / 50 / 55 / 60 / 65 / 70 / 75 / 80 / 85 / 90ISCO Cinemascope Ultra-Star 50	0070 410 00018
Adapter ring 3: Schneider Super-Cinelux 28 / 30 / 32.5	0070 410 00015
Adapter ring 4: Schneider Super-Cinelux 42.5 / 45 / 47.5	0070 410 00017
Adapter ring 5: Schneider Super-Cinelux 35 / 37.5 / 40	0070 410 00016
Adapter ring 6: ISCO Cinemascope Ultra-Star HD 29 / 32 / 35 / 38 / 40	0070 410 00001
Adapter ring 7: ISCO Cinemascope Ultra-Star HD 95 / 100	0070 410 00002
Adapter ring 8: Schneider Super-Cinelux 2 / 90	0070 410 00019
Adapter ring 9: ISCO Ultra-Star-Plus 2.1 375 / 40 / 45	0070 410 00013
Adapter ring 10: ISCO Ultra-Star-CS	0070 410 00014
Adapter ring 11: Schneider Super-Cinelux 2 / 95	0070 410 00009
Adapter ring 70,6 / 62,5	0070 410 00010
Eccentric tube Ø 70.6 E = 1,25	0070 410 00011
Eccentric tube Ø 101 E = 1,25	0070 410 00012

7.12 Xenon Bulbs and Adapters

Part / Name	Order Number
Note: Xenon bulbs, see price list	
Adapter for 1000 W/HSC, 1600 W/HSC, 2000 W	1000 404 57021
Adapter for 2000 W	1000 404 57017
Adapter for 2000 W/HS, 2500 W/HS, 3000 W/HS	1000 404 57018
Adapter for 3000 W/H	1000 404 57019
Adapter for 3000 W/HP digital console	1000 404 57015
Adapter for 4000 W/HS, 5000 W/HBM, 7000 W/HS	1000 404 57020
Adapter for 5000 W/H	1000 404 57044
Adapter for XBO 3000 W/HTP, 4000 W/HTP, 4500 W/HTP, 5000 W/HTP, 6000 W/HTP	1000 404 57035
Adapter for 2000 W/HTT	1000 404 57030
Adapter for 3600 W/HTM	1000 404 57031

8 Technical Data, Circuit Diagrams and Plans of Terminal Connections

8.1 Technical Data

8.1.1 Projector

Name	Cinema Projector
Type	FP 50 E PREMIERE
Machine No.	See data plate on housing.

Projector Connecting Data

Power supply	120/208 V, 3 ph, 5 wire -OR- 230/380 V, 5 wire
Frequency	50 Hz / 60 Hz
Pre-fuse	10 A
Power max.	Depends on equipment, see data plate

Power and Operating Data

Nominal rotary frequency of main motor	1500 rpm
Power of main drive motor	100 W
Framing	Endless via remote control
Running speed	24/25 fps

Sizes and Weights

Components	Sizes	Weights
Projector	1500 mm x 714 mm x 2240 mm	approx. 300 kg
Film reels	600 m / 1800 m / 2000 m	
Friction shafts	Ø 9 mm or Ø 12.7 mm	
Lens holder / turret	for lenses Ø 70.6 mm	
Apertures	1:1.37 / 1:1.66 / 1:2.35 (FP 30 E)	

8.1.2 Reverse-Scan Sound Device

Connecting Data

Power supply	24 V
Frequency	50 Hz / 60 Hz
Power max.	6 VA

Power and Operating Data

Frequency response	analog: 30 Hz - 16 kHz ± 1 dB digital: 20 Hz - 20 kHz ± 0.5 dB
Wow and flutter	≤ 0.1%

8.1.3 Lamphouse Data

Name	Universal Lamphouse
Type	1000 - 2000 W / 2000 - 7000 W
Machine No.	See data plate on housing.

Connecting Data

Power supply	120 V / 230 V
Frequency	50 Hz / 60 Hz
External required over-current protection	6.3 A
Power max.	depends on equipment

Sizes

Components	**Sizes**
Mirror	Ø 300 mm or Ø 340 mm

8.2 Plans of Terminal Connections

8.2.1 Plan of X1 Main Terminal Connections

Source (projector inside)	Color intern	No.	Color extern	Projector Outside
protect. conduct., ground (40) PE	gn/ye	**1**		mains connection 40
mains-phase (60) L1	bk	**2**		mains connection 60
mains-zero (20) PN	bl	**3**		mains connection 20
+24 V from control board K5-4	2/rd	**4**		24 V
24 V GND K5-3	2/bl	**5**		GND
relay dowser (FU 31) C/O 11	or	**6**		C/O
relay dowser (FU 32) C/O 14	or	**7**		C/O
relay RUN 11	gn	**8**		RUN
relay RUN 14	gn	**9**		RUN
** interface ext. film break K-29	rd/wt	**10**		ST200 E film break switch 37
* bridged	NC	**11**		ST200 E film break switch
** bridged	NC	**12**		other film break
** Interface ext. film break K2-30	rd/wt	**13**		other film break
spare	bl/wt	**14**		spare
L1/18	bk	**15**	wire 5	LH mains L1 60
N/19	bl	**16**	wire 6	LH mains N 20
relay XENON 21	br	**17**	wire 1	lamphouse (fan) 60A
relay XENON 24	br	**18**	wire 2	lamphouse (hour counter) 60B
relay XENON 14	wt	**19**	wire 3	lamphouse 122A
bridged	NC	**20**	wire 4	lamphouse 122
bridged	NC	**21**		xenon lamp rectifier enable
relay XENON 11	wt	**22**		xenon lamp rectifier enable
protect. conduct., ground (40) PE		**23**	gn/ye	LH + SH

* Terminals 11 and 12 are bridged when using the projector without a platter system

** Terminals 12 and 13 and terminals 10 and 13 are bridged when using the projector with a platter system

8.2.2 Plan of X2 Terminal Strip for Projector Functions (optional)

No.	Connection (source)	Colour	Interface: Terminal / No.	EMK 1 Connection: No. (bk)	Relay
1	+ 24 V	rd			
2	- 24 V	bl			
3	Start FOR-WARDS	wt	K2 / 24	3	1
4	GND / com	bk	K2 / 1, 12, 13	19	1 + 2
5	Stop	rs	K2 / 25	35	2
6	Dowser OPEN	ye	K2 / 27	44	3
7	GND / com	bk	K2 / 1, 12, 13	43	3 + 4
8	Dowser CLOSE	or	K2 / 26	28	4
9	GND / com	bk	K2 / 1, 12, 13	23	5 + 6 +7
10	Lens turret NS	gr	K2 / 16	39	5
11	Lens turret WS	or	K2 / 15	7	6
12	Lens turret CS	ye	K2 / 14	8	7
13	Focusing -	vio	K2 / 17		
14	GND / com	bk	K2 / 1, 12, 13		
15	Focusing +	rs	K2 / 18		
16	Framing DOWN	wt/gn	K2 /21		
17	GND / com	bk	K2 / 1, 12, 13		
18	Framing UP	wt/bl	K2 / 20		
19	Sensor 1	wt	Auto start with EMK outboard sensor with SA2 / CCA3	17	Input 1
20	Sensor 2	gn	Sensor with EMK inboard sensor with SA2 / CCA3		

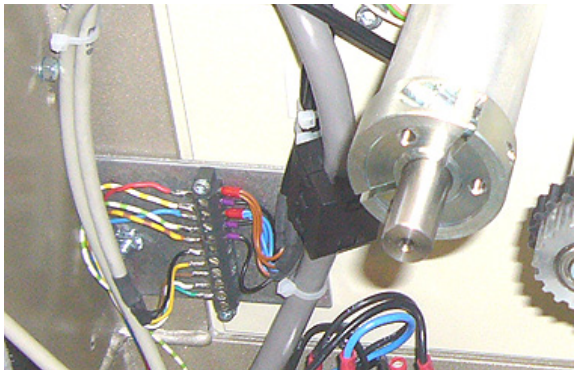
With CCA3, DMP1 or SA2 Automation System

21	Sensor 3 (with CCA 3, DMP 1)	center sensor
22	Reverse (with CCA 3, DMP 1 or SA 2)	K2-23
23	External start (with SA 2)	
24	EMERGENCY (with CCA 3, DMP 1 or SA 2)	

8.2.3 Plan of X3 Terminal Strip for Auditorium Functions with EMK 1 (option)

No.	Connection / Function	Color
1	Remote START	pink
2	Remote START	white
3	Emergency	brown/white
4	Emergency	brown
5	Stage light OFF	blue/white
6	Stage light ON	green
7	Stage light STOP	green/white
8	Stage light COM	orange
9	House light for slide show	violet/white
10	House light OFF	violet
11	House light HALF	white
12	House light ON	pink
13	Masking WS	brown
14	House light COM	grey
15	Masking CS	green/white
16	Masking WS	violet/white
17	Masking NS	grey/white
18	Masking STOP	black/white
19	Masking COM	brown/white
20	Curtain CLOSE	yellow
21	Curtain OPEN	yellow/white
22	Curtain STOP	black/white
23	Curtain COM	black
24	Xenon + 24 V	red
25	Xenon state	brown
26	Xenon 0 V	blue
27	Sensor 1	black
28 - 30	Reserve	

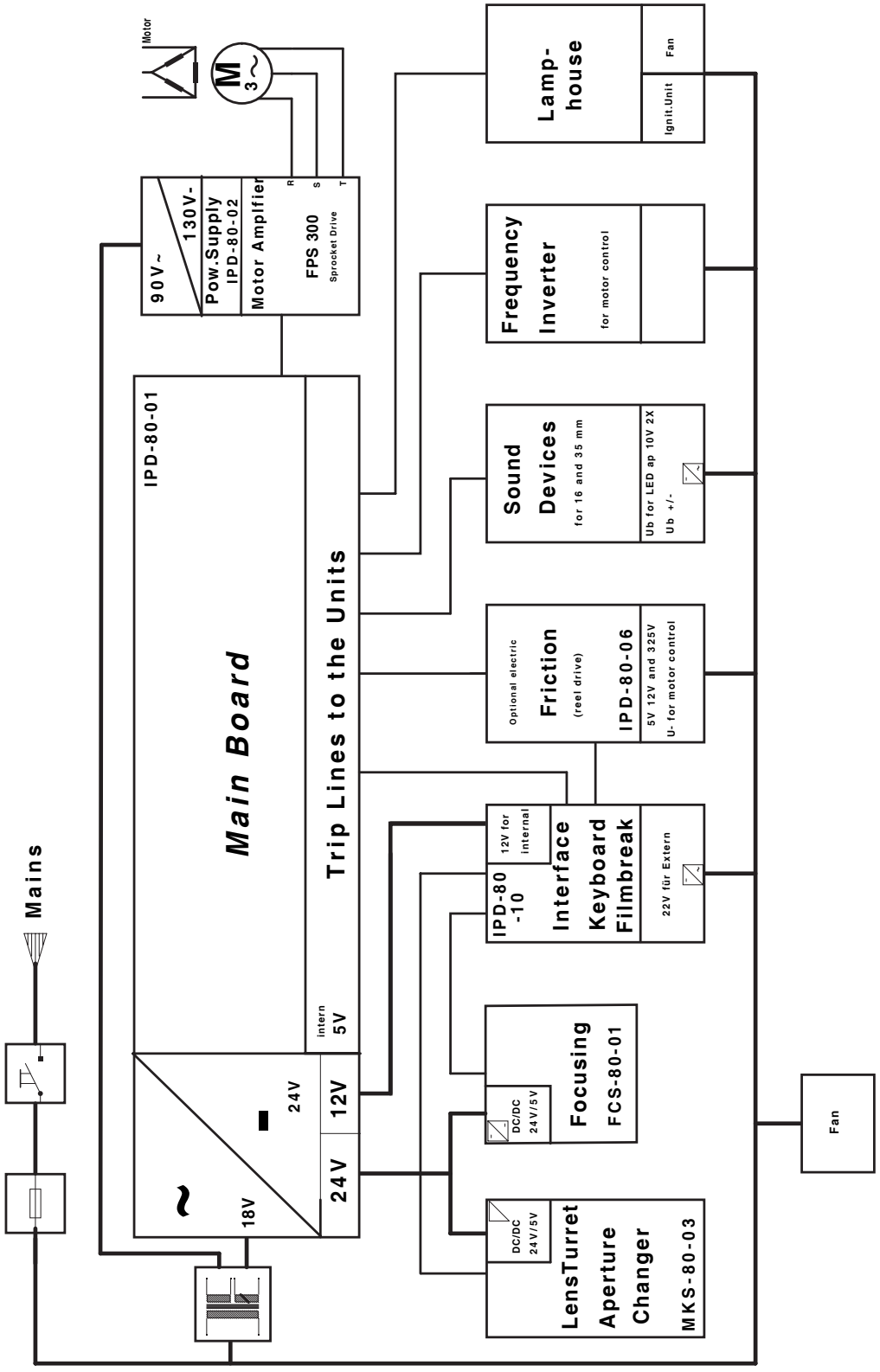
8.2.4 Sound Output on 8-pole Terminal Strip



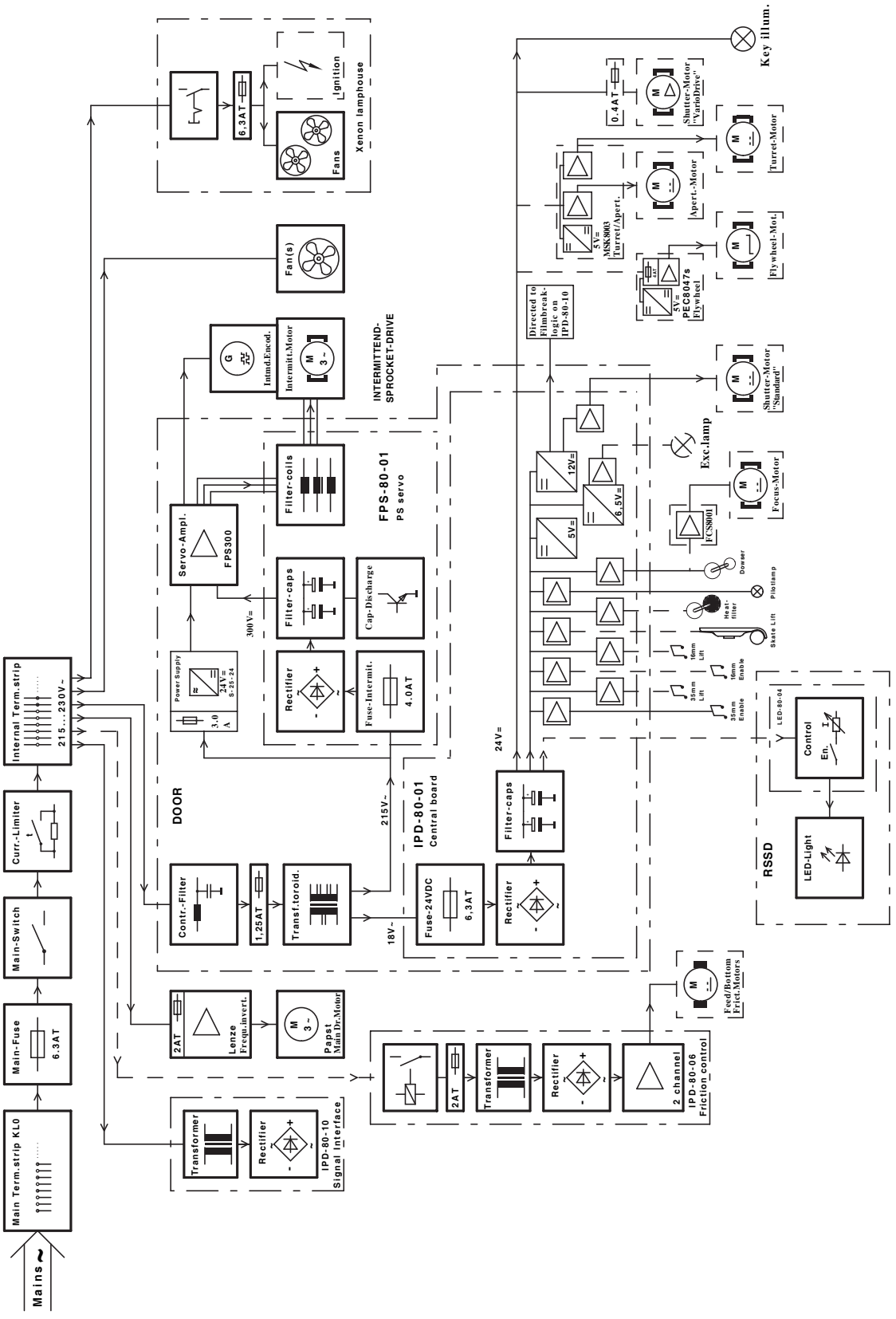
solar cell connection
solar cell connection
solar cell connection
shield
sound output left - (yellow)
sound output left + (brown)
sound output right - (white)
sound output right + (green)

8.3 Block and Circuit Diagrams

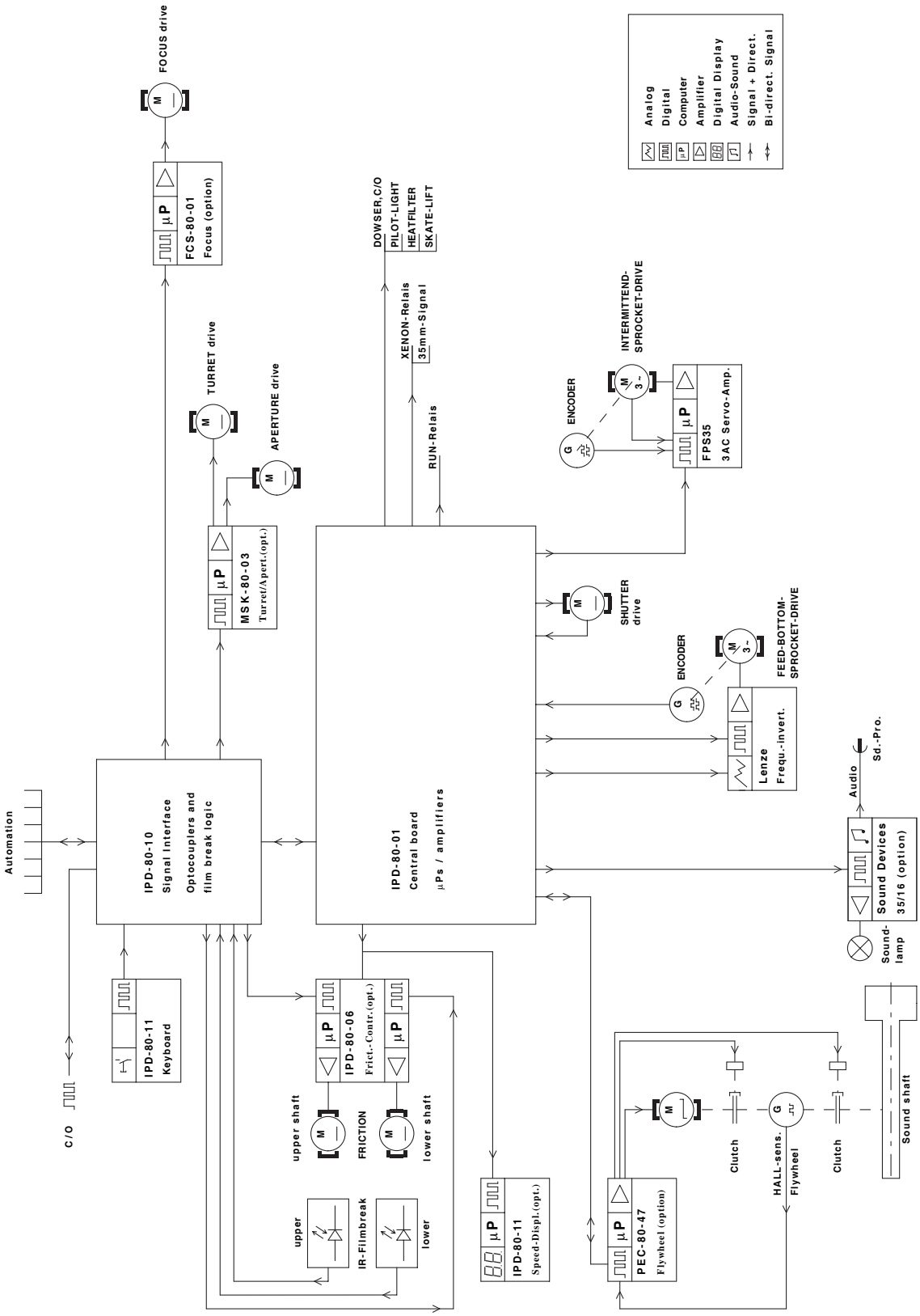
8.3.1 Block Diagram (Components Overview)



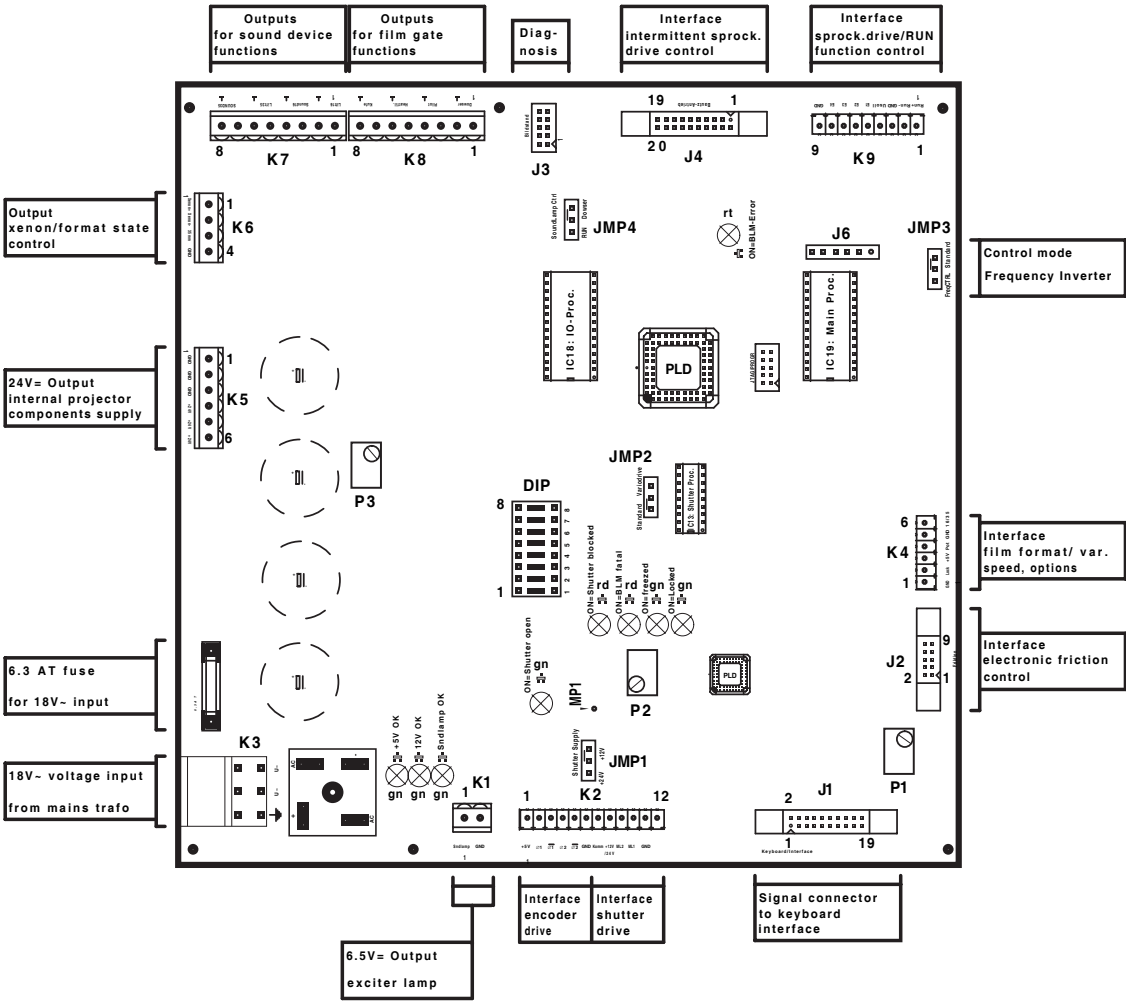
8.3.2 Block Diagram (Power)



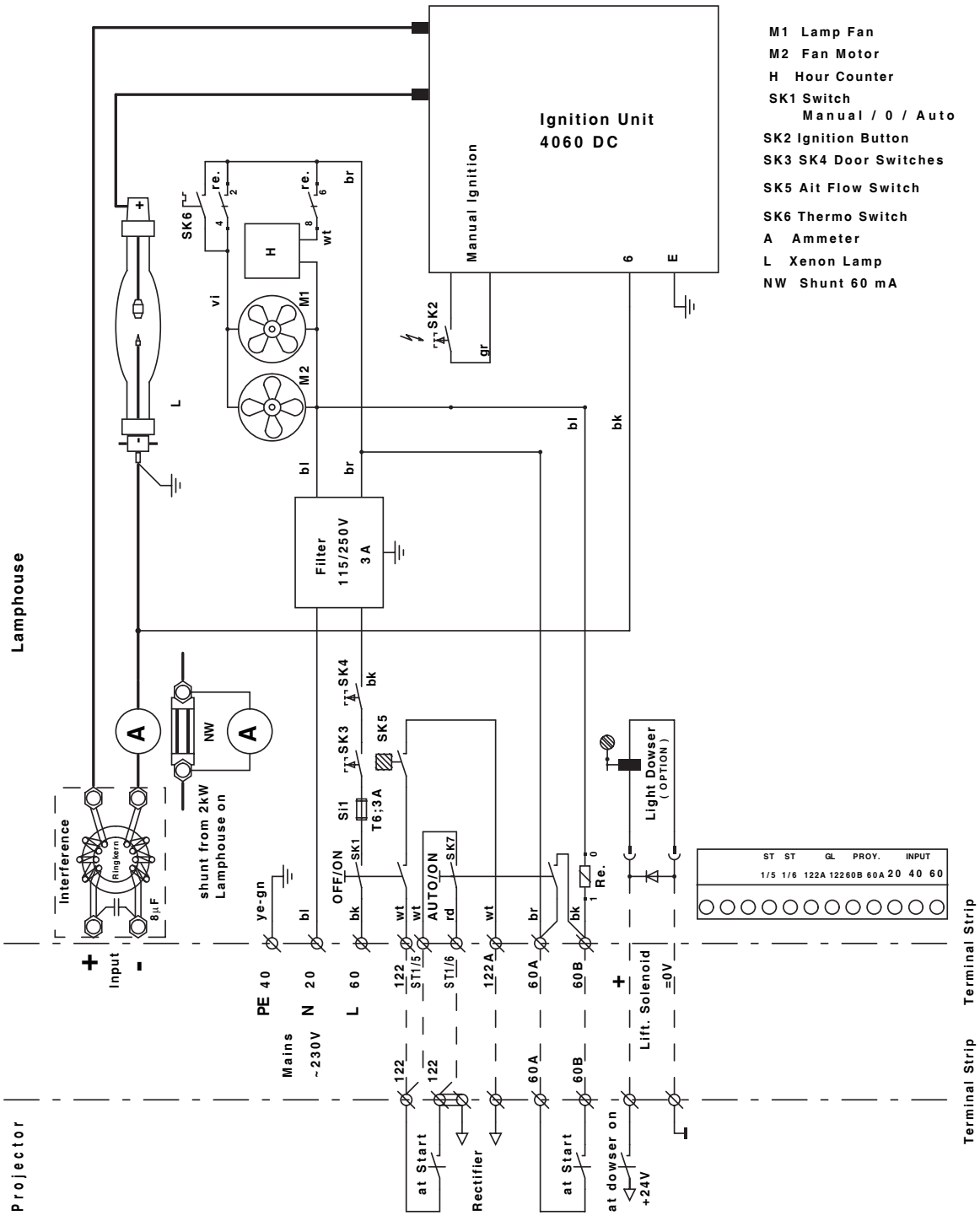
8.3.3 Block Diagram (Signals)



8.3.4 Main Board Components Overview



8.3.5 Lamphouse for 230 V Mains Connection



Kinoton GMBH

EC Declaration of Conformity

Company name	**Kinoton GmbH**
Address:	Industriestr. 20a, D-82110 Germering
Machine designation:	Cinema Console Projector
Machine type:	**FP 50 E**
Maschine serial number:	Z0258

Relevant EC stipulations:

Machine regulation	**2006/42/EG**
Low Voltage regulation	**2006/95/EG**
EMC regulation	**2004/108/EG**

Standards:

if need be harmonized standards	EN 50091 part 1, EN 60034-5, EN 61000-6-1, EN 61000-6-2
if need be national standards	DIN 19090 part 1 and part 2, VDE 05030

and technical specifications

the above-named machine is developed, constructed and manufactured in accordance with above-listed EC regulations and in sole responsibility of
Company: Kinoton GMbH
Industriestr. 20a
Germany 82110 Germering

Place, date:	Germering, 11. 01. 2010
Signature:	
Prename, name:	Herbert Zipfel
Function:	Production Manager